CÔTÉ GOLD PROJECT
Chester and Yeo Townships, Ontario

ENVIRONMENTAL EFFECTS REVIEW REPORT

Submitted by:
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M5H 2Y4

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INTRODUCTION AND ENVIRONMENTAL EFFECTS REVIEW CONTEXT

IAMGOLD Corporation (IAMGOLD) is a leading mid-tier gold producer headquartered in Toronto, Ontario. IAMGOLD is listed on the Toronto Stock Exchange main board under the symbol "IMG". IAMGOLD currently has four operating gold mines (including one joint venture) in Canada and abroad, and is in the process of developing additional projects, including the Côté Gold Project (the Project).

IAMGOLD acquired Trelawney Mining and Exploration Inc. (Trelawney) in 2012. Trelawney had been exploring the Project property since 2009, with the objective of developing an open pit gold mine and process plant. As of December 31, 2015, the Côté Gold drill hole database contains results of 536 diamond drill holes for a total of 273,475. IAMGOLD has also undertaken or commissioned environmental, hydrogeological, geotechnical, mineralogical, engineering, logistics and economic studies related to the potential development of the property.

Project Name:	Côté Gold Project
Proponent:	IAMGOLD Corporation
Primary Contact:	**IAMGOLD Corporation:** Steven Woolfenden, Director, Environment 401 Bay Street, Suite 3200 Toronto, Ontario, M5H 2Y4 Steven_Woolfenden@iamgold.com Telephone: 416-594-2884

IAMGOLD submitted a Project Description to the Canadian Environmental Assessment Agency (CEAA) on March 15, 2013. Based on the Project Description, CEAA determined that a Federal Environmental Assessment (EA), pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), was required. CEAA then issued draft Environmental Impact Statement (EIS) Guidelines on May 13, 2013 for review by federal departments, Indigenous groups and the

public. On July 9, 2013, the final EIS Guidelines were issued by CEAA outlining the scope of the EIS required for the Project.

IAMGOLD entered into a Voluntary Agreement with the Ontario Ministry of the Environment (later renamed the Ministry of the Environment and Climate Change (MOECC)) on May 3, 2013 to conduct a Provincial Individual EA for the Côté Gold Project. The Provincial EA process was then initiated through the submission of a Draft Terms of Reference (ToR), to facilitate ongoing public consultation on the Project. A Draft ToR was issued for a 30-day public review comment period between May 10, 2013 and June 9, 2013. The Draft ToR was subsequently revised, based on comments on the document and results of open houses, and was re-issued as the Proposed ToR for another 30-day public comment review period from July 19, 2013 and August 19, 2013. The Proposed ToR was approved by the Ontario Minister of the Environment on January 14, 2014.

The EIS / Draft EA report was prepared in accordance with the Proposed ToR and final EIS guidelines and was available for public review from June 13, 2014 to July 14, 2014. Comments received on the EIS / Draft EA report were addressed and incorporated into the Amended EIS / Final EA Report, which was submitted on February 20, 2015, hereafter defined as “the EA”.

IAMGOLD received the EA decision statement of approval issued by the Federal Minister of Environment and Climate Change Canada on April 13, 2016 and received a statement of approval from the Ontario Ministry of the Environment and Climate Change on December 22, 2016.

Following the receipt of the EA approvals for the Project, IAMGOLD has identified various opportunities to optimize the Project. IAMGOLD has also continued to review comments and feedback from First Nations and Métis, local communities, technical experts and government regulators. IAMGOLD also conducted a pre-feasibility study that assessed different options and has improved the Project economics, engineering, socio-economic benefits and reduced potential environmental effects.

To ensure changes to the Project design are well communicated to government regulators, the public and Indigenous communities, and in accordance with Federal and Provincial EA Conditions of Approval, IAMGOLD has undertaken an environmental effects review (EER) to evaluate the potential effects of changes resulting from the optimization of the Project compared to the EA.

Key refinements that were made to the Project during the optimization process are presented in Table ES-1, and include:

- A reduction in the Project footprint, specifically of the open pit, mine rock area (MRA) and Tailings Management Facility (TMF);
- reduction in key operating parameters, including the mining rate and maximum annual movements of ore, overburden and mine rock, and the total ore, overburden and mine rock over the life of the mine;
- relocation of the TMF nearer to the open pit, and no longer overprinting Bagsverd Creek; and
- reduction in power requirements which removes the need for the cross-country 230 kV transmission line from Timmins.

Table ES-1 Key Project Optimizations

Component	Previous Project Design (EA)	Current Project Design (EER)
Total Footprint	1,700 hectares (ha)	1,050 ha
Life of Mine	15 years	17 years
Open Pit and Ore Processing		
Footprint	210 ha	145 ha
Ore Processing Rate	60,000 tonnes per day (tpd)	36,000 tpd
Ore	261 million tonnes (Mt)	196 Mt
Mine Rock Area		
Footprint	400 ha	300 ha
Quantity	850 Mt	559 Mt
Tailings Management Facility		
Location	North of open pit (overprinting portions of Bagsverd Creek)	Northwest of open pit
Footprint	840 ha	478 ha
Storage Capacity	261 Mt	200 Mt
Maximum Dam Height	45 metres (m)	70 m
Water Discharge Location	Bagsverd Creek	Three Duck Lakes (Upper)
Camp Location	Northwest of Open Pit	Between Three Duck Lakes and Bagsverd Lake
Overburden Stockpile	Integrated in Mine Rock Area	Southwest of Open Pit
Watercourse Realignments	7.9 km (7 realignments)	2.4 km (2 realignments)
Transmission Line Alignment	230 kilovolt (kV) cross-country Alignment from Timmins (approximately 120 km)	Existing Hydro One Line from Timmins to Shining Tree and 115 kV transmission line alignment from Shining Tree (44 km)

PROJECT OVERVIEW

IAMGOLD proposes to construct, operate and eventually rehabilitate a new open pit gold mine. The Project is located in the Chester and Yeo Townships in the District of Sudbury, in northeastern Ontario. It is approximately 20 kilometers (km) southwest of Gogama, 130 km southwest of Timmins, and 200 km northwest of Sudbury (see Figure ES-1).

The Project site layout (see Figure ES-2) places the required mine-related facilities in close proximity to the open pit to the extent practicable, and on lands that are held fully and / or jointly by IAMGOLD. Ore processing will occur up to a rate of approximately 36,000 tpd. Overburden, mine rock and ore extracted from the open pit will be stockpiled in the overburden stockpile, MRA and ore stockpile, respectively. The Project footprint will cover approximately 1,050 ha (10.5 km^2), excluding the transmission line alignment footprint (TLA).

Ore processing will be carried out by conventional methods, using a combination of gravity separation and cyanidation for gold recovery, followed by in-plant cyanide recycling and destruction. Tailings will be stored in a constructed TMF. Water will be supplied to the ore processing plant from the mine water pond, the Reclaim Pond and Mesomikenda Lake. Site water will be discharged to Three Duck Lakes (Upper) via a Polishing Pond and / or following additional water treatment, if required. Discharge will meet applicable Federal and Provincial effluent discharge requirements and will be protective of aquatic life and receiving waters.

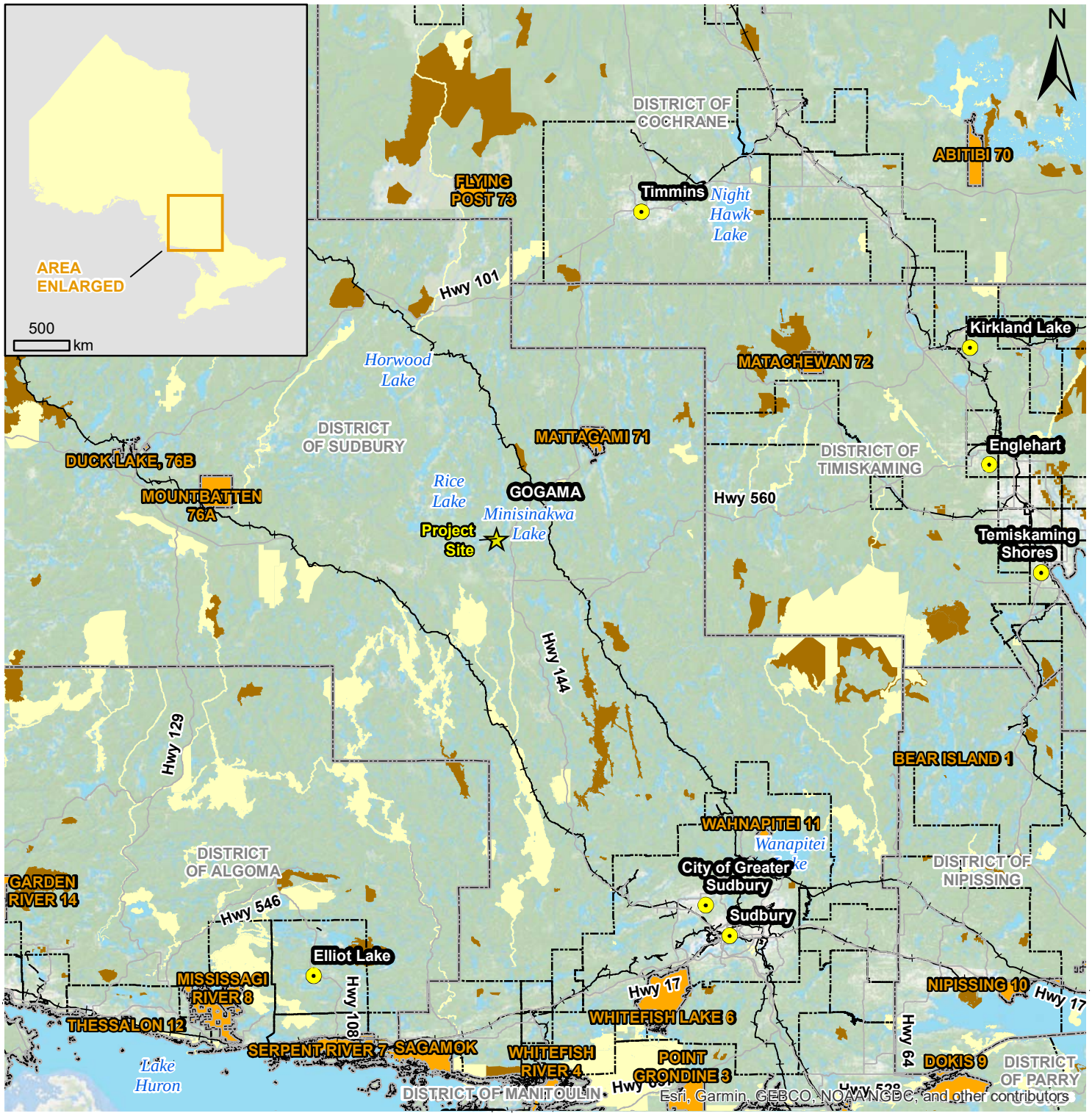
Mining operations will be supported by the development of an explosives manufacturing and storage facility. A maintenance garage, warehouse and administration complex will be developed adjacent to the ore processing plant.

An on-site accommodations complex will be developed at the start of construction with a capacity to host 1,000 to 1,200 workers. This complex will provide accommodation for the construction and operations workforce, some of which may commute from Gogama and from the Mattagami First Nation reserve. Potable water will be extracted primarily from groundwater resources.

IAMGOLD intends to deposit non-hazardous waste in a nearby off-site landfill currently operated by the Ministry of Natural Resources and Forestry (MNRF). The MNRF has been conducting a capacity study on the existing landfill to see if it will meet Project requirements and the future requirements of the existing local residences, and the permitting process for expansion is currently underway. IAMGOLD is planning to continue expanding its existing recycling program with the aim to minimize solid wastes. Domestic sewage will be treated using a sewage treatment plant. Hazardous solid and liquid waste will be hauled off site by licensed contractors to licensed disposal facilities. Opportunities to recycle some of the hazardous waste, such as used oil, will be investigated.

Initial power for construction will be provided by the existing transmission line connection to the Provincial electrical grid, supported by diesel power generator(s) (less than 5 MW). Permanent power for the Project will be supplied by refurbishment of an abandoned 115 kV circuit between the Timmins Transformer Station (TS) and Shining Tree Distribution Station (DS) operated by Hydro One Networks Inc. (Hydro One), and a new 115 kV transmission line from the Shining Tree DS to the mine using an existing Hydro One right-of-way (ROW).

To accommodate development of the open pit, Côté Lake will need to be dewatered and water bodies near the open pit will need to be dammed and / or realigned. Water from Clam Lake will be redirected and flow south through a realignment channel into Chester Lake and into newly created habitat, New Lake. New Lake will flow to the east (through a realignment channel) to Three Duck Lake (Upper). Pre-construction drainage patterns will be restored during Post-closure stage II.



LEGEND

- Regional Community
- Project Site Location
- Major Roads
- Railway
- Upper Tier Municipal Boundary
- Lower Tier Municipal Boundary
- Conservation Reserve (Regulated)
- Provincial Park
- First Nation Reserve
- Wooded Area
- Waterbody / Large Watercourse

NOTES

This map is for conceptual purposes only and should not be used for navigational purposes.
Basedata: ESRI, GARMIN, GEBCO, MOAA NGDC, and others contributers

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SCALE: 1:2,500,000
WHEN PLOTTED CORRECTLY AT 8.5 x 11
WGS 1984 Web Mercator Auxiliary Sphere

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CÔTÉ GOLD PROJECT - ENVIRONMENTAL EFFECTS REVIEW

PROJECT LOCATION

September, 2018	Rev 0.0	Figure No. ES-1
Project No. 209.40564.00000		

SLR global environmental solutions

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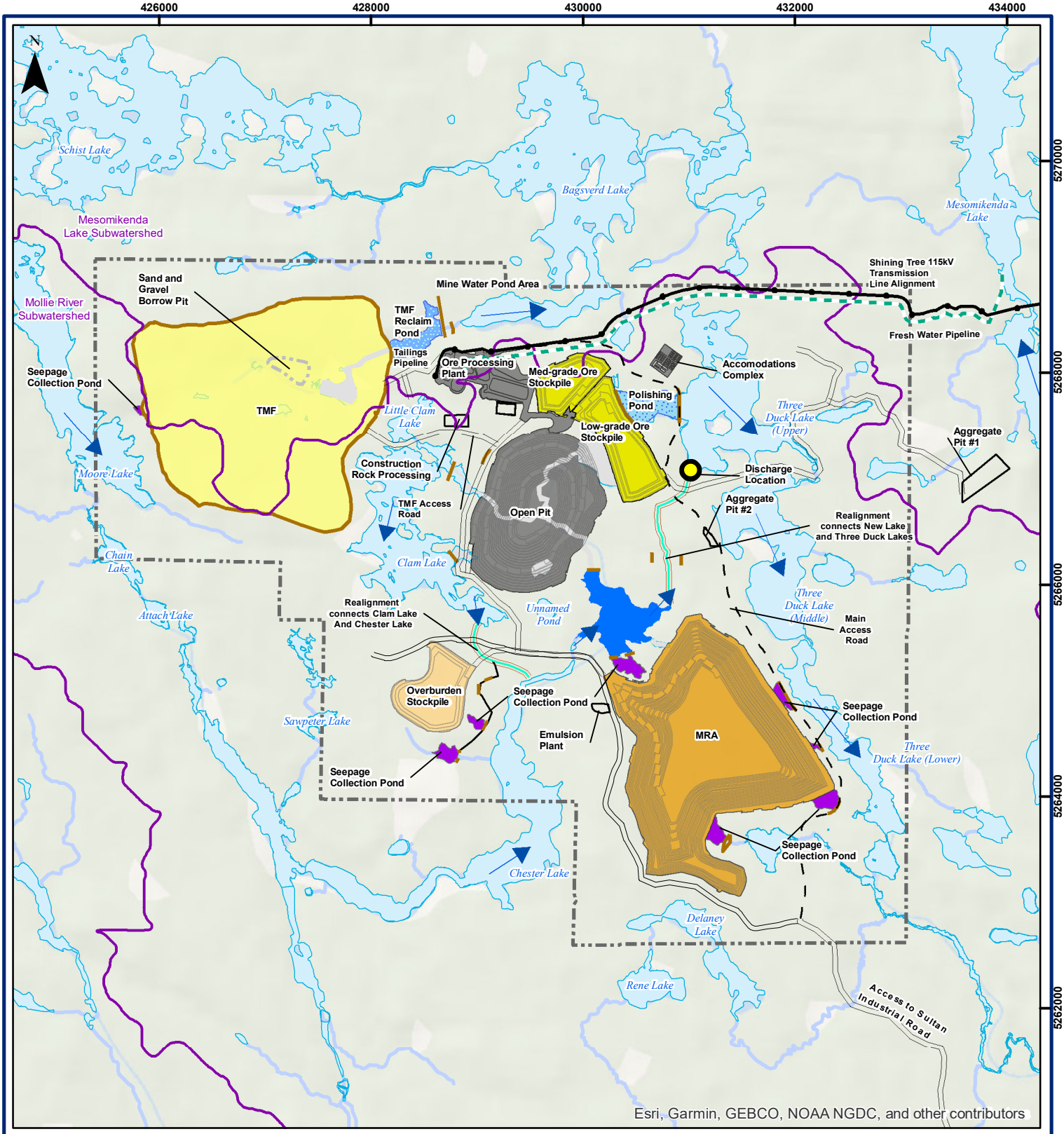

Legend

- Project Boundary
- Waterbody
- Overprinted Waterbody
- Watercourse
- Overprinted Watercourse
- Discharge Location
- Facility Road
- Main Access Road
- Water Flow Direction
- Dam
- Subwatershed Boundary
- Watercourse Reallignment
- Shining Tree 115 kV Transmission Line Alignment
- Fresh Water Pipeline
- Overburden Stockpile
- Tailings Management Facility (TMF)
- Sand and Gravel Borrow Pit
- Open Pit, Process Plant, and Camp
- Mine Rock Area (MRA)
- Ore Stockpile
- Facilities
- New Lake
- Polishing Pond
- TMF Reclaim Pond
- Seepage Collection Pond

NOTES

This map is for conceptual purposes only and should not be used for navigational purposes.

Basedata: All base data on this map was extracted from Land Information Ontario, MNDM, OBM Ontario Digital Geospatial Database and Ontario Road Network Database

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WHEN PLOTTED CORRECTLY AT 8.5 x 11

NAD 1983 UTM Zone 17N

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CÔTÉ GOLD PROJECT - ENVIRONMENTAL EFFECTS REVIEW

PROJECT SITE PLAN

September, 2018 | Rev 0.0 | Figure No. ES-2

Project No. 209.40564.00000

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SCOPE OF THE PROJECT AND ASSESSMENT

Physical Works

Physical works related to the Project are proposed to consist of:

- Open Pit: approximately 145 ha in area, with a depth of approximately 550 m. Mining will facilitate ore processing rates of approximately 36,000 tpd over an approximate 17-year period.
- Stockpiles: approximately 11 Mt of overburden and 559 Mt of mine rock, not required for site construction purposes, will be stored in surface stockpiles. A medium- and low-grade ore stockpile will also be developed.
- Ore processing plant: ore will be crushed, ground and processed on-site to recover gold. The exact gold production rate will depend on ore grade and gold prices. The doré gold bar product will then be securely transported off site by road. It is currently estimated that the final product will be shipped off site once per week.
- TMF: an optimized area for TMF development has been selected. This TMF covers an area of approximately 478 ha and will provide capacity for the storage of approximately 200 Mt of tailings over the life of the mine. The maximum projected dam height is expected to be in the range of 60 m to 70 m above grade.

- Water management facilities: the principal flows at the Project site will be managed with drainage works, pipelines and water management ponds. Watercourse realignments will be required around the open pit.
- Transmission line: power for the Project will be supplied by refurbishment of a 115 kV transmission line connected to the Hydro One Shining Tree DS, and a new 115 kV transmission line in an existing ROW from the Shining Tree DS to the mine site.

Ongoing exploration activities during the preparation of the Feasibility Studies have indicated that, in the long-term, there may be potential for Project Expansion. These opportunities may be pursued in the future, during the Operations phase of the Project, and would be subject to environmental permitting and approvals.

Associated buildings, facilities and infrastructure: currently planned and permanent on-site facilities include: a maintenance garage, a fuel and lube facility, a warehouse, an

administration complex, a construction and operations accommodations complex, an explosives manufacturing and storage facility, aggregate pits, fuel storage facilities, potable and process water treatment facilities and domestic and industrial solid waste handling facilities. These facilities will be supported by related on-site access roads, pipelines and power infrastructure.

Project Phases

Primary construction phase activities will include:

- Procurement of material and equipment;
- movement of construction materials to identified laydown areas and site;
- expansion of existing environmental protection and monitoring plan(s) for construction activities;
- construction of additional site access roads;
- construction of dams and water realignment channels / ditches for the development of the open pit, as well as the construction of the TMF;
- construction / placement of “compensatory” fish habitat within channel realignment works authorized to offset the loss of fish habitat;
- fish relocation and dewatering of Côté Lake, the Mollie River and Clam Lake to allow for the pre-stripping of the open pit;
- stripping of overburden and initiation of open pit mine development;
- development of aggregate source(s) anticipated to be principally for concrete manufacture, foundation work and TMF dam filter zones;
- establishment of site area drainage works, including pipelines from fresh water / recycled water sources;
- development and installation of construction facilities including laydown, accommodations complex, augmenting electrical substation capacity and other related construction infrastructure;
- construction of associated buildings and facilities, fuel bay, sewage plant and landfill (if developed);
- preparation of on-site mineral waste handling facilities, including the TMF dams; and
- construction and energizing of a transmission line including on-site electrical substation.

Activities that will be carried out during the Operations phase are anticipated to include:

- Ongoing management of chemicals and wastes;
- water management / treatment;

- air quality and noise management;
- environmental monitoring and reporting;
- follow-up environmental studies; and
- progressive site reclamation, where practical.

Closure phase activities will consist of the decommissioning and reclamation of the various Project components, including the 115 kV transmission line. The objective of closure is to reclaim the Project site area to as near a naturalized and productive condition as possible upon completion of mining. Open pit dewatering activities will cease to allow flooding.

The Post-closure phase will be carried out in two distinct stages. During Post-closure stage I, the open pit will continue to flood. It is anticipated that this stage could last approximately 25 to 30 years. Flooding will occur through natural groundwater infiltration and precipitation, as well as by active filling with water from multiple sources including some or all of the MRA seepage collection ponds, the Reclaim Pond, and other areas as directed by other pumping infrastructure. Monitoring of water quality in these areas will be ongoing during open pit filling, and if the water quality is deemed suitable for discharge to the environment, IAMGOLD may consider ceasing pumping from these areas to the open pit. Watercourse realignments and associated dams will be left in place during Post-closure stage I.

Post-closure stage II commences once the open pit is completely flooded. The objective of Post-closure stage II is to reincorporate the open pit lake into the existing water systems and to return the subwatersheds to their pre-mining conditions, as much as practicable.

The transmission line from the Shining Tree DS to the Project site will continue to operate during the Post-closure phase to provide power to the pump houses and potential water treatment system as required. Once water quality is suitable for discharge to the environment without treatment, there will no longer be a necessity to keep maintaining the transmission line and it, along with pumping infrastructure, will be dismantled.

A preliminary schedule for the development of the Project has pre-clearing for the construction phase commencing in the winter of 2018 / 2019. The decision to proceed with construction will depend on receipt of environmental approvals and Project economics, which is based on the projected gold price. The Operations phase is expected to start approximately two years following the commencement of construction and to continue for a 17 year mine life, based on the known reserves. The Closure phase will require approximately two years, followed by the Post-closure phase.

CONSULTATION

IAMGOLD's approach to consultation during the EER aligns with the company's corporate approach of building and preserving relationships with affected communities. The goal of consultation and communication efforts related to the EER is focused on sharing information about the Project and the proposed optimizations with the intent of gathering feedback and input from Indigenous communities, government agencies, public and other stakeholders.

The federal and provincial conditions of approval for the Côté Gold Project each included a list of Indigenous communities to be considered where relevant for the purpose of fulfilling specific conditions. The federal list included:

- Mattagami First Nation;
- Flying Post First Nation;
- Brunswick House First Nation; and
- Métis represented by the Métis Nation of Ontario Region 3 Consultation Committee.

The provincial list included all Indigenous communities and/or groups that IAMGOLD communicated with during the EA, specifically:

- Aundeck Omni Kaning First Nation;
- Beaverhouse First Nation;
- Brunswick House First Nation;
- Chapleau Ojibwe First Nation;
- Conseil de la Première Nation Abitibiwinni;
- Flying Post First Nation (represented by Wabun Tribal Council);
- Matachewan First Nation;
- Mattagami First Nation (represented by Wabun Tribal Council);
- Missanabie Cree First Nation;
- M'Chigeeng First Nation;
- Serpent River First Nation;
- Taykwa Tagamou Nation;

- Wahgoshig First Nation; and
- Métis Nation of Ontario – Region 3 (which represents Northern Lights and Temiskaming Métis Councils).

IAMGOLD's approach to Indigenous consultation related to the EER has focused on actively engaging affected communities identified through the EA process, namely Mattagami First Nation, Flying Post First Nation and Métis Nation of Ontario – Region 3. The other communities were provided information about the EER through the Project newsletters (February 2018 and May 2018) and received invitations to attend open houses in Gogama, Sudbury or Timmins held in February 2018 and June 2018.

Summary of Consultation and Communication

IAMGOLD initially planned and proposed two rounds of direct consultation related to the EER. IAMGOLD proposed to directly consult with the affected First Nation communities (Mattagami First Nation and Flying Post First Nation) and Métis Nation of Ontario (Region 3 Consultation Committee) in addition to hosting public open houses in Gogama, Timmins and Sudbury. Indigenous consultation was unable to occur until late spring 2018 despite best efforts and willingness of IAMGOLD to schedule sessions as early as December 2017. A summary of key consultation events is listed in Table ES-2.

Table ES-2: Summary of Key Consultation Events and Communications during the Preparation of the EER

Event Type	Location	Date(s)	Number of Participants*
Project Open Houses	Mattagami First Nation	May 28, 2018	31
	Flying Post First Nation	May 30, 2018	28
	Gogama	February 14, 2018 June 13, 2018	31 39
	Timmins	February 13, 2018 June 14, 2018	64 36
	Sudbury	February 15, 2018 June 15, 2018	52 34
Publication of Notice of Open House	Sudbury Star	February 3 and 10, 2018 June 9, 2018	NA
	Timmins Daily Press	February 3 and 10, 2018 June 9, 2018	NA

Event Type	Location	Date(s)	Number of Participants*
Meetings	CEAA	December 7, 2017	2
	Major Projects Management Office	December 7, 2017	2
	Meeting with representatives of Mattagami First Nation and Flying Post First Nation	December 8, 2018	4
	Métis Nation of Ontario	April 19, 2018	6
	Métis Nation of Ontario	June 15, 2018	1
Project Newsletters	NA	February 2018 May 2018	Distributed during Project open houses and sent directly via email to the Project mailing list

Note: *Does not include IAMGOLD representatives or Project team participants.

In addition to the meetings listed above, several meetings with Provincial government agencies have occurred related to permitting requirements.

The February 2018 Project open houses focused on providing an update on the Côté Gold Project and included:

- A Project overview and timeline;
- update on the Environmental Assessment approvals;
- Project news, including the investment by Sumitomo Metal Mining Co.;
- Project optimizations;
- environmental effects review process;
- Project closure; and
- ongoing communication and consultation opportunities.

The May / June 2018 Project open houses provided an opportunity for participants to learn about and provide feedback on:

- Improvements to the Project design since the environmental assessment process;
- results of the Environmental Effects Review;
- archaeological studies and findings, including a display with artefacts found at the Project site;

- Project closure – how the Project will be closed out at the end of the operations phase and what the land will look like post closure;
- transmission line environmental assessment;
- alternatives considered to manage tailings and mine rock; and
- plans for creation of new fish habitat.

In addition to the two *Let's Talk* Côté Gold Project newsletters (February 2018 and May 2018), IAMGOLD has updated the Project Fact Sheet and made this available during May / June consultation sessions and has posted it to the Project website (www.iamgold.com/cotegold) as well as a one-page handout highlighting the changes in the Project layout since the EA.

Comments Received During Preparation of the EER

Comments and questions received from First Nations and Métis during the preparation of the EER were primarily related to:

- Archaeological processes and protocols;
- effect of dewatering Côté Lake;
- assessment of potential effects on groundwater springs;
- effect of TMF on downstream water quality and fisheries;
- environmental monitoring;
- potential for effects from Shining Tree TLA on Indigenous traditional land uses;
- reliability of existing power supply to Mattagami First Nation;
- employment and business opportunities;
- cultural awareness training for employees and contractors;
- project closure;
- positive comments related to:
  - movement of the TMF and smaller Project footprint;
  - removal of the cross-country TLA from Project description; and
  - plans for on-site accommodations for workers from outside Mattagami First Nation or Gogama.

Comments and questions received from members of the public and other stakeholders during the preparation of the EER were primarily related to:

- Employment and business opportunities;
- concerns about potential for methylmercury production;
- TMF dam safety;
- potential noise effects at nearby receptors (e.g., cottages);
- access for Schist Lake / Wolf Lake cottagers and other land users;
- trapline near the Shining Tree TLA;
- use of the Project site following closure;
- removal of the cross-country TLA from the Project design and preference for Shining Tree TLA;
- relocation of the TMF away from Mesomikenda Lake;
- TMF no longer overprinting Bagsverd Creek as it is good turtle habitat; and
- new discharge location.

Several stakeholders indicated that their previous concerns have been addressed through the Project optimizations.

IAMGOLD continues to work with Mattagami First Nation and Flying Post First Nation on their review of the technical aspects of the EER and will continue to respond to any questions or concerns that they or other Indigenous communities or other stakeholders may have regarding the Project.

Status of Agreements

A Process and Funding Agreement has been reached between IAMGOLD, Mattagami First Nation and Flying Post First Nation related to the communities' involvement through the review of the EER and required regulatory permit applications to advance the Project. IAMGOLD continues to negotiate additional agreements with Mattagami First Nation, Flying Post First Nation and Métis Nation of Ontario (Region 3). The details of the negotiations are confidential, as per the agreement of all parties involved.

SUMMARY OF ENVIRONMENTAL EFFECTS REVIEW

The same methodology that was applied to the EA was applied to the EER, to assess and compare the predicted residual environmental effects (effects) resulting from Project optimization. This included the following steps:

- Review of effects assessment indicators – effects assessment indicators that formed part of the EA were re-evaluated with the team of experts responsible for each discipline and it was concluded that these were still applicable to this EER.
- Updating of study areas – study areas defined in the EA to describe the geographic extent of potential environmental effects were re-evaluated and updated as needed to reflect the updated Project layout.
- Updating the prediction of potential effects – based on the Project design, including mitigation, effects in the EA were re-evaluated through modelling or qualitative analysis.
- Updating mitigation measures – updating measures for the elimination, reduction or control of adverse environmental effects.
- Updating the significance – based on the results of the assessment of potential effects and the application of mitigation measures, the significance of the residual effect, or the potential impact, is assessed through predetermined assessment criteria (magnitude, geographic extent, duration, frequency, reversibility and likelihood) and a significance decision tree.

The effects which were identified in the EA were re-evaluated, and updated where applicable, in relation to the Project. Residual adverse effects that are determined to be significant are not acceptable for the Project and when required, further mitigation, monitoring and management measures were incorporated in the Project to reduce the significance level of such potential effects.

Temporal boundaries for the Project phases (Construction, Operations, Closure and Post-closure) generally remain the same as the EA, although the Operations phase has been extended from 15 to 17 years.

Potential effects, effect indicators, mitigation and management strategies were re-evaluated, and results were documented for each discipline through an Updated Technical Memorandum (UTM). The EER presents the findings of the UTMs in a format similar to the EA in order to present results in a like-for-like comparison.

Table ES-3 presents a summary of the results of the reviews conducted for each discipline, and the determination of significance of the residual effects for the Project.

Table ES-3 Summary of EER Results

Technical Discipline	Summary of EER Results	Residual Impact Significance
Air Quality	The updated air quality assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Results of air dispersion modelling demonstrate that modelled concentrations have decreased at all off-site receptors for all particulate size fractions, all averaging times and the modelled concentrations for the metals that correspond directly with particulate matter. In addition, the GHG emissions for the Project are expected to be notably less than effects presented in the EA. The mitigation measures and monitoring measures outlined in the EA pertaining to the protection of ambient air quality and GHG are unchanged for the Project.	Not significant
Noise and Vibration	The updated noise and vibration assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. In most cases, predicted noise levels and blasting noise and vibration levels at the receptors are less than or equal to the levels reported in the EA. While there were some increases at certain receptors, these were within regulatory limits. Nighttime operation restrictions proposed in the EA are no longer required as the predicted sound levels are within nighttime criteria limits. The change in site plan and reduced production rate resulted in reduced noise effects at the receptors. The noise and vibration monitoring plan has not been changed from the EA.	Not significant
Hydrogeology	The updated hydrogeological assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Given that the footprint of the open pit has been reduced and is within the originally proposed extent for predictions of water level drawdowns, the estimates effects in the EA are anticipated to be similar and likely conservative. Mitigation measures and commitments for the groundwater monitoring program have not changed from the EA.	Not significant
Hydrology and Climate	The updated hydrological assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Changes to watershed areas will be partially offset by the construction of realignment channels that are intended to maintain flow paths and flow magnitudes similar to those currently observed. The modelled magnitude of surface water flow change for each of the Project phases was typically less than 10% from existing flows and limited in spatial extent. Mitigation measures have not changed from the EA, and the monitoring program also remains unchanged with the exception of Bagsverd Creek no longer being affected by the Project.	Not significant

Technical Discipline	Summary of EER Results	Residual Impact Significance
Water Quality	The updated water quality assessment demonstrates that the predicted effects for the Project are similar or reduced compared to the EA. The effluent discharge location has been moved from Neville Lake to Three Duck Lakes (Upper), which provides the benefit of eliminating any potential effects that nutrient loading would have on dissolved oxygen depletion in Mesomikenda Lake. Furthermore, the TMF has been moved into the Mollie River Watershed. Therefore, almost all of the effluent that enters the surface water receiving environment, whether it be through discharge from the polishing pond or via seepage, is contained within the Mollie River Watershed. These changes allow for more focused monitoring and management of effluent, and mitigation measures can be more easily implemented (if determined to be needed) in comparison to the EA.	Not significant
Terrestrial Biology	The updated terrestrial biology assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. The Project footprint, including both the smaller area impacted for the TMF construction and the use of an existing transmission line and ROW for the TLA, have decreased the amount of habitat which will be affected from that predicted in the EA. Mitigation and monitoring measures are generally consistent with the EA, although updated to reflect the EER site plan including TLA and updated government standards and protocols.	Not significant
Aquatic Biology	The updated aquatic biology assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Fewer potential effects to the aquatic environment are predicted as a result of the smaller and more compact footprint, reduced loss and disruption of aquatic habitat and maintaining of watershed boundaries. Furthermore, several potential effects to Commercial, Recreational, and Aboriginal fisheries have been reduced, and fewer substances were found to exceed selected toxicity benchmarks compared to the EA. The maximum predicted arsenic concentrations in the EA were higher than current predictions and thus any effects are expected to be less. Overall, predicted conditions appear to be improved to those predicted for the EA. Mitigation and monitoring measures have not changed from the EA, with the exception of monitoring program updates to reflect the changes in the site plan.	Not significant

Technical Discipline	Summary of EER Results	Residual Impact Significance
Land and Resource Use	The updated land and resource use assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Fewer effects to land and resource uses are predicted as a result of the smaller Project footprint, relocation of the TMF and updated TLA. Mitigation measures will continue to be implemented as described in the EA, although some measures / strategies have been updated to reflect the Project design or have been introduced post-EA in response to comments received during the EA review.	Not significant
Traditional Land Use	The updated traditional land use assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Fewer effects to traditional land uses are predicted, attributed to the smaller Project footprint, relocation of the TMF and discharge location, and updated TLA. Mitigation and monitoring measures / strategies proposed in the EA for traditional land use continue to be applicable. Some measures / strategies have been refined or introduced post-EA in response to comments received during the EA review process.	Not significant
Human and Ecological Health Risk	The updated human and ecological health risk assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Human and ecological health risks associated with airborne concentrations are predicted to be less than or equal to those predicted in the EA as a result of the optimized footprint. As compared to the EA, potential water quality related effects are nominally different and are considered immaterial.	Not significant
Visual Aesthetics	The updated human and ecological health risk assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. The updated viewshed analysis determined that overall, the number of receptors that will have the viewscape affected by the Project is consistent with the EA. Overall and consistent with the EA, the effect of the Project on the visual landscape during all the phases is perceptible but will not affect enjoyment of the viewscape for the receptors.	Not significant
Socio-Economics	The updated socio-economic assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Overall, effects predictions have not changed, except for the duration of effects, which are anticipated to last an additional two years given the change from 15 to 17 years of mine operations. Additional or modified mitigation, enhancement and monitoring activities have been introduced in response to comments received since submission of the EA.	Not significant

Technical Discipline	Summary of EER Results	Residual Impact Significance
Archaeology and Built Heritage	The updated archaeological and built heritage assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Archaeological and built heritage assessments have continued to be carried out throughout the past 8 years on properties associated with the Project. Since the submission of the EA, additional archaeological field work has been conducted resulting from the optimizations of the Project site plan. New archaeological sites have been identified and revisions have been made to the Cultural Heritage Value or Interest statuses and mitigative measures for a number of previously-identified archaeological sites. Site management and protection strategies have been revised accordingly and future work has been recommended where applicable.	Not significant

CONCLUSION

IAMGOLD has undertaken the EER to ensure changes to the Project have been duly assessed such that changes to the potential environmental effects of the Project are identified, documented and properly managed. Additionally, the EER provides IAMGOLD an opportunity to communicate these changes to government regulators, the public and Indigenous communities, and it is intended to comply with Federal and Provincial EA Conditions of Approval. Several meetings have been held with First Nation communities, Métis Nation of Ontario, along with hosting public open houses in Gogama, Timmins and Sudbury. Feedback received has led to further discussions and optimizations to the Project.

The results of the EER confirm that the predicted environmental effects of the Project are similar or reduced compared to the EA. Therefore, the conclusions of the EA, including the determinations of significance of residual effects, remain valid. The EER demonstrates that the Project is an overall improvement compared to the EA.

IAMGOLD

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1.0 INTRODUCTION AND PROJECT OVERVIEW

1.1 Project Proponent Information and Contacts

IAMGOLD Corporation (IAMGOLD) is a mid-tier mining company with four operating gold mines (including one joint venture) in Canada and abroad. These assets in North and South America and West Africa are complemented by development and exploration projects, and continued assessment of acquisition opportunities.

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IAMGOLD is listed on the Toronto Stock Exchange under "IMG" and on the New York Stock Exchange as "IAG". As a Canadian reporting issuer, with securities listed on the Toronto Stock Exchange, IAMGOLD has in place a corporate governance structure that is responsive to Canadian regulatory requirements. The Board of Directors' primary duty and responsibility is to supervise or oversee the management of the business and affairs of the Corporation, with a view to the long-term best interests of the Corporation, including all of its stakeholders, such as shareholders. The Board of Directors discharges this primary duty either directly or through committees that it oversees. Committees of the Board report to the Board with respect to the performance and fulfillment of their Board-approved mandates. There are currently four standing committees, which ensure adherence to published policies, including:

- Code of Business Conduct and Ethics;
- Shareholder Engagement Policy;
- Stock Trading Policy;
- Anti-Bribery and Anti-Corruption Policy;
- Disclosure Policy; and
- Whistleblower Policy.

Zero Harm is IAMGOLD's vision that guides all operations and activities undertaken by IAMGOLD. It is IAMGOLD's commitment to continually strive to reach the highest standards in human health and safety, minimization of impacts on the environment, and working co-operatively with host communities.

IAMGOLD's Zero Harm Vision can be summarized as follows:

- HSS Policies: IAMGOLD expects a commitment to health, safety and sustainability from all of our employees from our operators, to our contractors to our CEO. Through this commitment we embrace:
  - RESPECT: Our activities will be conducted in a way that respects cultures, customs, social values, laws and human rights.
  - ENGAGEMENT: We will pursue the support of host communities and governments through responsive, meaningful dialogue.
  - ENVIRONMENTAL STEWARDSHIP: Our sustainability policy guides our actions and focuses our efforts on understanding the interaction between our activities and the protection of the environment while maximizing sustainable development.
  - HEALTH AND SAFETY: We will promote a work environment where the health and safety of people are always our first priorities.

With regards to Health and Safety, IAMGOLD requires a commitment by all employees and contractors to work toward a workplace free of incidents and illness. IAMGOLD strives to protect all employees and contractors against workplace hazards. Achieving and maintaining 'zero injuries' is a continuous journey, with management providing the leadership and direction and employees involved in developing the safety practices.

These guiding principles will be applied through a commitment to:

- Understanding that no task is so important that it cannot be completed safely;
- providing a safe and healthy workplace for all our people;
- training and continually motivating our people to work in a safe and responsible manner;
- incorporating leading practices within health and safety in the planning and decision-making process throughout the life cycle of our operations;
- achieving excellence in health and safety performance through the application of leading practices;
- complying with relevant legislation and exceeding community expectations;
- striving towards continuous improvement in our safety and health performance by setting and reviewing achievable targets; and
- holding employees and contractors accountable for our health and safety performance.

Through its internal management structure IAMGOLD will implement these policies during all phases of the Côté Gold Project (the Project).

1.2 Project Background and Environmental Effects Review Context

IAMGOLD proposes to construct, operate and eventually rehabilitate a new open pit gold mine. IAMGOLD acquired Trelawney Mining and Exploration Inc. (Trelawney) in 2012; Trelawney had been exploring the Project property since 2009. As of December 31, 2015, the Côté Gold drill hole database contains results of 536 diamond drill holes for a total of 273,475 m. Additionally, IAMGOLD has undertaken or commissioned environmental, hydrogeological, geotechnical, mineralogical, engineering, logistics and economic studies related to potential property development.

The Project is located in the Chester and Yeo Townships in the District of Sudbury, northeastern Ontario. It is approximately 20 kilometres (km) southwest of Gogama, 130 km southwest of Timmins, and 200 km northwest of Sudbury (see Figure 1-1).

IAMGOLD submitted a Project Description to the Canadian Environmental Assessment Agency (CEAA) on March 15, 2013. Based on the Project Description, CEAA determined that a Federal Environmental Assessment (EA), pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), was required. CEAA then issued draft Environmental Impact Statement (EIS) Guidelines on May 13, 2013 for review by federal departments, Indigenous groups and the public. On July 9, 2013, the final EIS Guidelines were issued by CEAA outlining the scope of the EIS required for the Project.

IAMGOLD entered into a Voluntary Agreement with the Ontario Ministry of the Environment (later renamed the Ministry of the Environment and Climate Change (MOECC)[1]) on May 3, 2013 to conduct a Provincial Individual EA for the Côté Gold Project. The Provincial EA process was then initiated through the submission of a Draft Terms of Reference (ToR), to facilitate ongoing public consultation on the Project. A Draft ToR was issued for a 30-day public review comment period between May 10, 2013 and June 9, 2013. The Draft ToR was subsequently revised, based on comments on the document and results of open houses, and was re-issued as the Proposed ToR for another 30-day public comment review period from July 19, 2013 and August 19, 2013. The Proposed ToR was approved by the Ontario Minister of the Environment on January 14, 2014.

The EIS / Draft EA report was prepared in accordance with the Proposed ToR and final EIS guidelines and was available for public review from June 13, 2014 to July 14, 2014. Comments received on the EIS / Draft EA report were addressed and incorporated into the Amended EIS / Final EA Report, which was submitted on February 20, 2015, hereafter defined as “the EA”.

[1] It is noted that during the time of writing, the Ministry of the Environment and Climate Change (MOECC) was renamed as the Ministry of the Environment, Conservation and Parks (MECP). MOECC has been used throughout this document for the sake of simplicity.

IAMGOLD received the EA decision statement of approval issued by the Federal Minister of Environment and Climate Change Canada on April 13, 2016 and received a statement of approval from the Ontario Ministry of the Environment and Climate Change on December 22, 2016.

Following the receipt of the EA approvals for the Project, IAMGOLD has identified various opportunities to optimize the Project. IAMGOLD has also continued to review comments and feedback from First Nations and Métis, local communities, technical experts and government regulators. IAMGOLD conducted a pre-feasibility study that assessed different options and has improved the Project economics, engineering, socio-economic benefits and reduced potential environmental effects. Key refinements that were made to the Project during the optimization process are listed in Table 1-1 and include:

- A reduction in the Project footprint, specifically of the open pit, mine rock area (MRA) and Tailings Management Facility (TMF);
- reduction in key operating parameters, including the mining rate and maximum annual movements of ore, overburden and mine rock, and the total ore, overburden and mine rock over the life of the mine;
- relocation of the TMF nearer to the open pit, and no longer overprinting Bagsverd Creek; and
- reduction in power requirements which removes the need for the cross-country 230 kV transmission line from Timmins.

Table 1-1 Key Project Optimizations

Component	Previous Project Design (EA)	Current Project Design (EER)
Total Footprint	1,700 hectares (ha)	1,050 ha
Life of Mine	15 years	17 years
Open Pit and Ore Processing		
Footprint	210 ha	145 ha
Ore Processing Rate	60,000 tonnes per day (tpd)	36,000 tpd
Ore	261 million tonnes (Mt)	196 Mt
Mine Rock Area		
Footprint	400 ha	300 ha
Quantity	850 Mt	559 Mt
Tailings Management Facility		
Location	North of open pit (overprinting portions of Bagsverd Creek)	Northwest of open pit
Footprint	840 ha	478 ha
Storage Capacity	261 Mt	200 Mt
Maximum Dam Height	45 metres (m)	70 m
Water Discharge Location	Bagsverd Creek	Three Duck Lake (Upper)

Component	Previous Project Design (EA)	Current Project Design (EER)
Camp Location	Northwest of Open Pit	Between Three Duck Lakes and Bagsverd Lake
Overburden Stockpile	Integrated in Mine Rock Area	Southwest of Open Pit
Watercourse Realignments	7.9 km (7 realignments)	2.4 km (2 realignments)
Transmission Line Alignment	230 kilovolt (kV) cross-country Alignment from Timmins (approximately 120 km)	Existing Hydro One Line from Timmins to Shining Tree and 115 kV transmission line alignment from Shining Tree (44 km)

IAMGOLD has undertaken an environmental effects review (EER) to ensure changes to the Project are duly assessed such that changes to the potential environmental effects of the Project are identified, documented and properly managed. Additionally, the EER provides IAMGOLD an opportunity to communicate these changes to government regulators, the public and Indigenous communities, and is intended to comply with Federal and Provincial EA Conditions of Approval.

1.3 Project Overview

IAMGOLD proposes to construct, operate and eventually rehabilitate a new open pit gold mine. The Project is located in the Chester and Yeo Townships in the District of Sudbury, in northeastern Ontario. It is approximately 20 km southwest of Gogama, 130 km southwest of Timmins, and 200 km northwest of Sudbury (see Figure 1-1).

The Project site layout (see Figure 1-2) places the required mine-related facilities in close proximity to the open pit to the extent practicable, and on lands that are held fully and / or jointly by IAMGOLD. Open pit mining operations will facilitate ore processing rates of approximately 36,000 tpd. Overburden, mine rock and ore extracted from the open pit will be stockpiled in the overburden stockpile, MRA and ore stockpile, respectively. The Project footprint will cover approximately 1,050 ha (10.5 km^2), excluding the transmission line alignment footprint (TLA).

Ore processing will be carried out by conventional methods, using a combination of gravity separation and cyanidation for gold recovery, followed by in-plant cyanide recycling and destruction. Tailings will be stored in a constructed TMF. Water will be supplied to the ore processing plant from the mine water pond, the Reclaim Pond and Mesomikenda Lake. Site water will be discharged to Three Duck Lake (Upper) via a Polishing Pond and / or following additional water treatment, if required. Discharge will meet applicable Federal and Provincial effluent discharge requirements and will be protective of aquatic life and receiving waters.

Mining operations will be supported by the development of an explosives manufacturing and storage facility. A maintenance garage, warehouse and administration complex will be developed adjacent to the ore processing plant.

An on-site accommodations complex will be developed at the start of construction with a capacity to host 1,000 to 1,200 workers. This complex will provide accommodation for the construction and operations workforce, some of which may commute from Gogama and from the Mattagami First Nation reserve. Potable water will be extracted primarily from groundwater resources.

IAMGOLD intends to deposit non-hazardous waste in a nearby off-site landfill currently operated by the Ministry of Natural Resources and Forestry (MNRF). The MNRF has been conducting a capacity study on the existing landfill to see if it will meet Project requirements and the future requirements of the existing local residences, and the permitting process for expansion is currently underway. IAMGOLD is planning to continue expanding its existing recycling program with the aim to minimize solid wastes. Domestic sewage will be treated using a sewage treatment plant. Hazardous solid and liquid waste will be hauled off site by licensed contractors to licensed disposal facilities. Opportunities to recycle some of the hazardous waste, such as used oil, will be investigated.

Initial power for construction will be provided by the existing transmission line connection to the Provincial electrical grid, supported by diesel power generator(s) (less than 5 MW). Permanent power for the Project will be supplied by refurbishment of an abandoned 115 kV circuit between the Timmins Transformer Station (TS) and Shining Tree Distribution Station (DS) operated by Hydro One Networks Inc. (Hydro One), and a new 115 kV transmission line from the Shining Tree DS to the mine using an existing Hydro One right-of-way (ROW).

To accommodate development of the open pit, Côté Lake will need to be dewatered and the area around the open pit will need to be dammed and / or realigned. Water from Clam Lake will be redirected and flow south through a realignment channel into Chester Lake and into newly created habitat, New Lake. New Lake will flow to the east (through a realignment channel) to Three Duck Lake (Upper). Pre-construction drainage patterns will be restored during Post-closure stage II.

1.4 Project Components and Phases

Physical works related to the Project are proposed to consist of:

- Open Pit: approximately 145 ha in area, with a depth of approximately 550 m. Mining will facilitate ore processing rates of approximately 36,000 tpd over an approximate 17-year period.
- Stockpiles: approximately 11 Mt of overburden and 559 Mt of mine rock, not required for site construction purposes, will be stored in surface stockpiles. A medium- and low-grade ore stockpile will also be developed.
- Ore processing plant: ore will be crushed, ground and processed on-site to recover gold. The exact gold production rate will depend on ore grade and gold prices. The doré gold

bar product will then be securely transported off site by road. It is currently estimated that the final product will be shipped off site once per week.

- TMF: an optimized area for TMF development has been selected. This TMF covers an area of approximately 478 ha and will provide capacity for the storage of approximately 200 Mt of tailings over the life of the mine. The maximum projected dam height is expected to be in the range of 60 to 70 m above grade.
- Water management facilities: the principal flows at the Project site will be managed with drainage works, pipelines and water management ponds. Watercourse realignments will be required around the open pit.
- Transmission line: power for the Project will be supplied by refurbishment of a 115 kV transmission line connected to the Hydro One Shining Tree DS, and a new 115 kV transmission line in an existing ROW from the Shining Tree DS to the mine site.

Ongoing exploration activities during the preparation of the Feasibility Studies have indicated that, in the long-term, there may be potential for Project expansion. These opportunities may be pursued in the future, during the Operations phase of the Project, and would be subject to environmental permitting and approvals.

Associated buildings, facilities and infrastructure: currently planned and permanent on-site facilities include: a maintenance garage, a fuel and lube facility, a warehouse, an administration complex, a construction and operations accommodations complex, an explosives manufacturing and storage facility, aggregate pits, fuel storage facilities, potable and process water treatment facilities and domestic and industrial solid waste handling facilities. These facilities will be supported by related on-site access roads, pipelines and power infrastructure.

Primary construction phase activities will include:

- Procurement of material and equipment;
- movement of construction materials to identified laydown areas and site;
- expansion of existing environmental protection and monitoring plan(s) for construction activities;
- construction of additional site access roads;
- construction of dams and water realignment channels / ditches for the development of the open pit, as well as the construction of the TMF;
- construction / placement of “compensatory” fish habitat within channel realignment works authorized to offset the loss of fish habitat;
- fish relocation and dewatering of Côté Lake, the Mollie River and Clam Creek to allow for the pre-stripping of the open pit;
- stripping of overburden and initiation of open pit mine development;

- development of aggregate source(s) anticipated to be principally for concrete manufacture, foundation work and TMF dam filter zones;
- establishment of site area drainage works, including pipelines from fresh water / recycled water sources;
- development and installation of construction facilities including laydown, accommodations complex, augmenting electrical substation capacity and other related construction infrastructure;
- construction of associated buildings and facilities, fuel bay, sewage plant and landfill (if developed);
- preparation of on-site mineral waste handling facilities, including the TMF dams; and
- construction and energizing of a transmission line including on-site electrical substation.

Activities that will be carried out during the operations phase are anticipated to include:

- Ongoing management of chemicals and wastes;
- water management / treatment;
- air quality and noise management;
- environmental monitoring and reporting;
- follow-up environmental studies; and
- progressive site reclamation, where practical.

Closure phase activities will consist of the decommissioning and reclamation of the various Project components, including the 115 kV transmission line. The objective of closure is to reclaim the Project site area to as near a naturalized and productive condition as possible upon completion of mining. Open pit dewatering activities will cease to allow flooding.

The Post-closure phase will be carried out in two distinct stages. During Post-closure stage I, the open pit will continue to flood. It is anticipated that this stage could last approximately 25 to 30 years. Flooding will occur through natural groundwater infiltration and precipitation, as well as by active filling with water from multiple sources including some or all of the MRA seepage collection ponds, the Reclaim Pond, and other areas as directed by other pumping infrastructure. Monitoring of water quality in these areas will be ongoing during open pit filling, and if the water quality is deemed suitable for discharge to the environment, IAMGOLD may consider ceasing pumping from these areas to the open pit. Watercourse realignments and associated dams will be left in place during Post-closure stage I.

Post-closure stage II commences once the open pit is completely flooded. The objective of Post-closure stage II is to reincorporate the open pit lake into the existing water systems and to return the subwatersheds to their pre-mining conditions, as much as practicable.

The transmission line from the Shining Tree DS to the Project site will continue to operate during the Post-closure phase to provide power to the pump houses and potential water treatment system as required. Once water quality is suitable for discharge to the environment without treatment, there will no longer be a necessity to keep maintaining the transmission line and it, along with pumping infrastructure, will be dismantled.

A preliminary schedule for the development of the Project has pre-clearing for the construction phase commencing in the winter of 2018 / 2019. The decision to proceed with construction will depend on receipt of environmental approvals and Project economics, which is based on the projected gold price. The Operations phase is expected to start approximately two years following the commencement of construction and to continue for a 17 year mine life, based on the known reserves. The Closure phase will require approximately two years, followed by the Post-closure phase.

1.5 Geographic Setting

The Project is located in the Chester and Yeo Townships in the District of Sudbury, northeastern Ontario. Project coordinates (NAD 83) are as follows:

- Centroid of the open pit:
  - Universal Transverse Mercator, Zone 17 (UTM) 429,629 N, 5,266,765 E (NAD 1983, UTM Zone 17N);
  - latitude / longitude (degrees, minutes, seconds), -81º 56' 6.995" W, 47º 33' 1.757" N (decimal degrees: -81.9353, 47.5506);
- transmission line alignment start and end points:
  - start point from Shining Tree DS:
    - UTM 469594 E, 5259333 N,
    - latitude / longitude 47º 48' 67.26" N, -81º 40' 36.23" W (decimal degrees: 47.486726, -81.403623,);
  - end point at the Project site:
    - UTM 428610 E, 5267970 N,
    - latitude / longitude 47º 56' 23.27" N, -81º 94' 90.07" W (decimal degrees: 47.5398, -81.9155,).

The Project site comprises an area dominated by soil and till over bedrock in a relatively flat landscape. The area is mainly characterized by gentle hills, forests, lakes and rivers. The site is

located on two main subwatersheds, the Mollie River system and the Mesomikenda River system.

The Project is located in a low density rural area, including local communities and First Nation reserves which are part of Treaty 9. The Project site does not directly overlap with First Nation reserve lands. The Mattagami 71 Reserve is the closest First Nation reserve land, located approximately 40 km north of the Project site. IAMGOLD consulted with potentially affected Indigenous communities with respect to Project effects. Through advice from the Provincial and Federal Crowns, and through consultation with the Indigenous communities, IAMGOLD has determined that the Côté Gold Project is located primarily within the traditional territory of the Mattagami First Nation and the Flying Post First Nation, with the exception of a small portion of the 44 km transmission line which appears to be located within the traditional territory of Matachewan First Nation. Boundaries for these territories are determined internally between the Wabun Tribal Council members and are not shared publicly.

Métis reside and / or may exercise harvesting rights in the Project area and are represented through the provincial organization of the Métis Nation of Ontario (MNO). The Project is located within the MNO Region 3 harvesting area.

Land use in the Project area consists of recreational activities by locals and tourists, including fishing, camping and hunting, and a few cottages are located on Mesomikenda Lake. It is also extensively used for sustainable harvesting of timber; however there is no active agricultural use in the Project area.

Two provincial parks are in the general vicinity of the Project: Spanish River and Biscotasi Lake Provincial Parks, located approximately 20 km southwest of the Project and La Motte Lake Provincial Park, located approximately 24 km northeast of the Project.

1.6 Land Ownership

A large portion of the area around the Project site is designated as active mining claims or mining leases. The gold mineralization, as currently understood, is located within 13 claims in Chester Township (RPA Inc., 2012). IAMGOLD continues to have an Exploration Agreement in place with both Mattagami and Flying Post First Nations, as these First Nation's territories are in close proximity to the Project site.

Following receipt of the EA decision, IAMGOLD acquired mineral rights, previously unavailable, that surround the original mine footprint from Sanatana Resources (Sanatana), a company which jointly held mineral claims within the Project area. This acquisition has enabled IAMGOLD to optimize the land use with respect to siting the TMF and minimizing the environmental footprint of the Project.

Additional easements and land requirements that were considered during the EIS / EA are no longer required. All mine related facilities are on lands that are owned fully and / or jointly by IAMGOLD.

2.0 CONSULTATION SUMMARY

2.1 Introduction

IAMGOLD's approach to consultation during the EER aligns with the company's corporate approach of building and preserving relationships with affected communities and interested stakeholders. Identifying and building relationships with communities and stakeholders occurred during the federal and provincial EAs, which began in the spring of 2013 and has continued since federal project approval in April 2016 and provincial approval in January 2017. Information about consultation and engagement activities during the preparation of the EA can be found in Chapter 4 and Appendix D of the Amended EIS / Final EA Report. IAMGOLD continued to keep Indigenous communities and stakeholders engaged through open houses and site tours in 2015.

Following the receipt of the EA approvals, IAMGOLD proposed to optimize the Project and prepare this EER. This chapter contains information about communication and engagement activities following EA completion and in support of the EER process (January 2017 to July 2018).

Appendix A contains detailed records of consultation, comments and concerns raised during the preparation of the EER, as well as copies of Notices and other Project-related communications.

2.2 Identification of Stakeholders and Indigenous Groups

Stakeholders, Indigenous groups (First Nation and Métis) and government agencies who were anticipated to have an interest in the Project were identified during early consultation efforts. The list has evolved over time. Table 2-1 provides an overview of how each of these groups is categorized.

Table 2-1: Stakeholders and Indigenous Groups

Type	Example
Stakeholders	• Local businesses / business organizations • Community organizations • Non-governmental organizations • Environmental non-governmental organizations • Local educational / service institutes
Indigenous Groups	• Indigenous communities • Indigenous leadership • Tribal Councils
Government Agencies	• Municipal governments and representatives • Provincial (Ontario) governments and representatives • Federal government and representatives

The federal and provincial conditions of approval for the Côté Gold Project each included a list of Indigenous communities to be considered where relevant for the purpose of fulfilling specific conditions. The federal list included:

- Mattagami First Nation;
- Flying Post First Nation;
- Brunswick House First Nation; and
- Métis represented by the Métis Nation of Ontario Region 3 Consultation Committee.

The provincial list included all Indigenous communities and/or groups that IAMGOLD communicated with during the EA, specifically:

- Aundeck Omni Kaning First Nation;
- Beaverhouse First Nation;
- Brunswick House First Nation;
- Chapleau Ojibwe First Nation;
- Conseil de la Première Nation Abitibiwinni;
- Flying Post First Nation (represented by Wabun Tribal Council);
- Matachewan First Nation;
- Mattagami First Nation (represented by Wabun Tribal Council);
- Missanabie Cree First Nation;
- M'Chigeeng First Nation;
- Serpent River First Nation;
- Taykwa Tagamou Nation;
- Wahgoshig First Nation; and
- Métis Nation of Ontario – Region 3 (which represents Northern Lights and Temiskaming Métis Councils).

IAMGOLD's approach to Indigenous consultation related to the EER focused on actively engaging affected communities identified through the EA process, namely Mattagami First Nation, Flying Post First Nation and Métis Nation of Ontario – Region 3. The other communities were provided information about the EER through the Project newsletters (February 2018 and May 2018) and received invitations to attend open houses in Gogama, Sudbury or Timmins held in February 2018 and June 2018.

IAMGOLD developed a Project mailing list during EA preparation and has continued to maintain the list, updating it as individuals or organizations request to be added or removed.

2.3 Goals of Consultation

IAMGOLD's objective for consultation related to the EER is to update Indigenous groups, government agencies and interested stakeholders for the purpose of:

- Maintaining and enhancing existing relationships;
- providing updates on the Project, EA conditions and permitting processes;
- sharing information about the proposed optimizations identified through the Pre-Feasibility Study, including how comments heard during the EA process were addressed through the optimizations;
- ensuring Indigenous groups and stakeholders have an opportunity to understand the proposed optimizations of the Côté Gold Project;
- gathering input and feedback on the proposed optimizations to inform the EER development; and
- documenting and responding to any issues or concerns raised during consultation.

2.4 Information Sharing and Engagement Activities

IAMGOLD has continued to share information about the Project following submission of the EA and its subsequent approval. Information sharing and engagement activities since January 2016 included:

- Newsletters and other communication materials;
- Project notifications;
- open houses;
- meetings; and
- updates to the Project website.

Each of these activities are described below.

2.4.1 Newsletters and Other Communication Materials

IAMGOLD published a variety of plain-language resources for stakeholders and the general public: newsletters, a Project changes highlights document, an updated fact sheet and an FAQ which explains the Project and its timeline. These materials were posted on IAMGOLD's website (www.iamgold.com/cotegold-documents), distributed during Project open houses and sent directly via email to individuals on the Project mailing list.

In addition to the two *Let's Talk* Côté Gold Project newsletters (February 2018 and May 2018), IAMGOLD created a one-page handout highlighting the changes in the Project layout since the EA and updated the Project Fact Sheet (Frequently Asked Questions [FAQ] document). These

resources were available during the May / June consultation sessions, were posted to the Project website (www.iamgold.com/cotegold) and were shared by email to all individuals on the Project mailing list. Table 2-2 provides an overview of the content contained within the newsletter, handout and FAQ document.

Table 2-2: Newsletters and Handouts

Publication Type	Publication / Distribution Date	Contents
Let's Talk Newsletter	February 2018	• Project overview • Notice of Approval – Environmental Assessment • Investment Agreement with Sumitomo Metal Mining Co. Ltd. • Pre-feasibility Study completion and initiation of Feasibility Study • Environmental Effects Review, including key optimizations of the Côté Gold Project • Proposed Project schedule • Upcoming consultation and community engagement
Let's Talk Newsletter	May 2018	• Environmental Effects Review including summary of changes to predicted effects and how key optimizations responded to concerns heard during the EA process • Transmission line environmental assessment • Tailings management facility and mine rock area alternatives assessment • Offsetting of fish habitat changes • Archaeological work in the Project area • Project closure • Proposed Project schedule • Process for applying to work for the Côté Gold Project • Upcoming consultation and community engagement.
Handout	February 2018	• Key optimizations of the Côté Gold Project showing a Project layout comparison and a table with key Project components highlighting key EA design and current design aspects

Publication Type	Publication / Distribution Date	Contents
Frequently Asked Questions	May 2018	• Project location and ownership • Proposed Project schedule • Information about employment • Where to find information about Project procurement and business opportunities • IAMGOLD's Zero Harm framework • Regulatory approvals • Environmental Effects Review • Changes made to the Project based on feedback received during the EA process • Key optimizations of the Côté Gold Project • Project design and milling rate • How gold mines work • Project closure • Steps IAMGOLD takes to protect the environment • How the Project will affect lakes and streams • Project effects on land uses

Copies of newsletters, the Project handout and FAQ document are located in Appendix A-1.

2.4.2 Project Notifications

To ensure continued Indigenous, stakeholder and community engagement, IAMGOLD published notices of the 2018 open houses in newspapers in Sudbury and Timmins, on the dates as summarized in Table 2-3. In addition, IAMGOLD sent invitations on February 9, 2018 and June 6, 2018 to invite all individuals on the Project mailing list to attend open houses in Timmins, Gogama and Sudbury. Print copies of invitations to open houses were distributed to each household in Gogama prior to the open houses. Invitations to the May 28, 2018 open house in Mattagami First Nation and the May 30, 2018 open house Flying Post First Nation were provided by email on May 17, 2018 for distribution to community members.

In addition to notices of open houses, IAMGOLD also published a Notice of Public Meeting for Closure Plan and a Notice of Commencement of a Screening outlining the process IAMGOLD must follow to determine the environmental effects of the installation of a 115 kV transmission line connecting the Project to the Hydro One network near the Shining Tree Distribution Station. The Notice of Commencement of a Screening was also sent to all Indigenous communities, the MNRF for distribution to potentially affected land users and to all members of the Project mailing list (email dated June 14, 2018). All notifications published during preparation of the EER are presented in Table 2-3.

Table 2-3: Notifications

Event Type	Location	Date(s)
Notice of Open House	Sudbury Star	February 3 and 10, 2018 June 9, 2018
	Timmins Daily Press	February 3 and 10, 2018 June 9, 2018
Notice of Commencement of a Screening – Côté Gold Transmission Line Project	Sudbury Star	May 26, 2018
	Timmins Daily Press	May 26, 2018
Notice of Public Meeting for Closure Plan	Sudbury Star	June 9, 2018
	Timmins Daily Press	June 9, 2018

Copies of Notices are presented in Appendix A-2.

2.4.3 Open Houses

In 2017, IAMGOLD began planning for a renewed engagement of Indigenous communities and stakeholders to share Project updates and information about proposed optimizations. IAMGOLD initially planned and proposed two rounds of direct consultation related to the EER. IAMGOLD proposed to directly consult with the affected First Nation communities (Mattagami First Nation and Flying Post First Nation) and Métis Nation of Ontario (Region 3 Consultation Committee) in addition to hosting public open houses in Gogama, Timmins and Sudbury. Indigenous consultation was unable to occur until late spring 2018 despite best efforts and willingness of IAMGOLD to schedule sessions as early as December 2017. Open houses were held in the Indigenous communities in May 2018. IAMGOLD hosted open houses in Gogama, Timmins and Sudbury in February and June of 2018. A total of 315 people attended the eight open houses held in 2018 (see Table 2-4 for details).

Table 2-4: Community Open Houses

Event Type	Location	Date(s)	Number of Participants*
Project Open Houses	Mattagami First Nation	May 28, 2018	31
	Flying Post First Nation	May 30, 2018	28
	Gogama	February 14, 2018 June 13, 2018	31 39
	Timmins	February 13, 2018 June 14, 2018	64 36
	Sudbury	February 15, 2018 June 15, 2018	52 34

Note: Does not include IAMGOLD representatives or Project team participants.

Copies of open house presentations and poster boards are provided in Appendix A-3. Comment forms received during open houses are provided in Appendix A-4.

2.4.4 Summary of Meetings

Meetings with Indigenous communities and their representatives, government agencies and the public that occurred between January 2017 and June 30, 2018 are summarized in the following sections.

2.4.4.1 Indigenous

Indigenous consultation and engagement efforts have been ongoing since EA approvals. Meetings and discussions have focused on providing Project updates and in May 2018, a full-day cross-cultural relationship-building session was held with the leadership of Mattagami First Nation and Flying Post First Nation, their technical consultants and IAMGOLD and Sumitomo representatives. Numerous meetings were held with Indigenous communities during preparation of the EER, including meetings held with technical reviewers engaged by Mattagami First Nation and Flying Post First Nation to conduct technical reviews of the EER and draft regulatory permit applications. A summary of all meetings and interactions with Indigenous communities is provided in Appendix A-5.

Efforts to build upon and enhance existing relationships were also demonstrated through IAMGOLD's sharing of a traditional meal with Mattagami officials and staff in November 2017 and a full-day, facilitated workshop focused on building relationships, resolving conflicts and identifying steps to further develop the relationship in April 2018. In total, 35 people attended the day-long workshop.

2.4.4.2 Public and Other Stakeholders

Engagement with the public in the time following the provincial and federal EA approvals was limited to the 2018 community open houses in Gogama, Timmins and Sudbury and select meetings with key community representatives to provide updates on the Project. A summary of all meetings and interactions with the public and other stakeholders is provided in Appendix A-6.

2.4.4.3 Government Agencies

IAMGOLD and members of the Côté Gold Project team (including consultants) met by phone or in-person numerous times with federal and provincial government specialists and officials, including elected officials, between January 2017 and June 2018 to provide Project updates and discuss the EER and various permit applications. A summary of all meetings and interactions with government agencies and government officials is provided in Appendix A-7.

2.4.5 Project Website Updates

The Côté Gold website (www.iamgold.com/cotegold) is a central resource for the public, interested stakeholders and potential investors. The website was updated in early 2018 to communicate information about the provincial and federal approvals and the EER. A summary of information available on the Côté Gold Project website is presented in Table 2-5.

Table 2-5: Côté Gold Project Website

Website Section	Content
Overview	• Project location • Project components • Ownership and history
Geology & Mineralization	• Geology and mineralization
Côté Gold Animation	• Animation describing Project in the context of Ontario's geography, geology and infrastructure and also discusses the size and potential of the Project
Environmental Assessment and Approvals	• Explanation of federal and provincial EA processes • Overview of the EA process for Côté Gold Project, including key consultation milestones • Overview of permits and approvals • EER overview, including how IAMGOLD will communicate with government regulators, the public and Indigenous communities
Community Engagement	• IAMGOLD's approach to Indigenous consultation, stakeholder engagement and community relations • Upcoming engagement events • List of past engagement events since November 2013
Documents	• Côté Gold Frequently Asked Questions (FAQ) • *Let's Talk* Newsletters • Notices • Provincial and federal EA documents and links to other related documents including notices of approval
Contact Us	• IAMGOLD mailing address, phone numbers and a Project-specific email address for those wanting more information or to share their comments

2.5 Comments Received During Preparation of the EER

Comments and questions received from First Nations and Métis during the preparation of the EER were primarily related to:

- Archaeological processes and protocols;
- effect of de-watering Côté Lake;
- assessment of potential effects on groundwater springs;
- effect of TMF on downstream water quality and fisheries;
- environmental monitoring;
- potential for effects from Shining Tree TLA on Indigenous traditional land uses;
- reliability of existing power supply to Mattagami First Nation;

- employment and business opportunities;
- cultural awareness training for employees and contractors;
- Project closure;
- positive comments related to:
  - movement of the TMF and smaller Project footprint;
  - removal of Cross-Country TLA from Project description; and
  - plans for on-site accommodations for workers from outside Mattagami First Nation or Gogama.

Comments and questions received from members of the public and other stakeholders during the preparation of the EER were primarily related to:

- Employment and business opportunities;
- concerns about potential for methylmercury production;
- TMF dam safety;
- potential noise effects at nearby receptors (e.g., cottages);
- access for Schist Lake / Wolf Lake cottagers and other land users;
- trapline near the Shining Tree TLA;
- use of the Project site following closure;
- removal of the Cross-Country TLA from the Project design and preference for Shining Tree TLA;
- relocation of the TMF away from Mesomikenda Lake;
- TMF no longer overprinting Bagsverd Creek as it is good turtle habitat; and
- new discharge location.

Several stakeholders indicated that their previous concerns have been addressed through the Project optimizations.

IAMGOLD continues to work with Mattagami First Nation and Flying Post First Nation on their review of the technical aspects of the EER and will continue to respond to any questions or concerns that they or other Indigenous communities or other stakeholders may have regarding the Project.

Table 2-6 presents a summary of comments received from First Nations and Métis during the preparation of the EER.

Table 2-6: Summary of Comments – First Nation and Métis

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
Mattagami First Nation		
General	• When will construction begin?	• Construction will begin in early 2019, with tree clearing occurring prior to the breeding bird season.
Mine Rock Area	• Why were other locations not considered for the placement of mine rock or tailings?	• IAMGOLD's preference is to keep it all in one area that can be safely managed.
	• Why would IAMGOLD not put some mine rock back into the pit?	• This is not a feasible option due to factors such as space and safety during operations.
	• Could any of the mine rock be placed closer to the open pit?	• A detailed assessment of alternatives has identified that the currently selected MRA location is the most suitable option.
	• Why was Mine Rock Area alternative #5 rejected?	• It is too small to accommodate all the mine rock.
Aquatic Resources	• Can you explain exactly what's going to happen to Côté Lake?	• Côté Lake is approximately 12 hectares in size with a maximum depth of about 9 feet. It is located directly atop the gold deposit that will become the open pit. The area will be de-watered and will be excavated to become part of the mine.
	• [related to TMF and MRA] How do you plan on keeping ammonia levels down and runoff from seeping into the surrounding waterways?	• Explosives are the source of ammonia. The use of ammonia will be tightly managed, so that there will be very little residual ammonia. Runoff from the MRA and TMF will be captured. With time, residual ammonia will degrade. Modelling shows that ammonia in receiving water will meet applicable guidelines. This will be monitored during project operations.
	• Could there be marine archaeological resources in Côté Lake?	• The Ministry has agreed that it would be sufficient to have a licensed archaeologist and First Nation monitor during the Côté Lake de-watering. If any archaeological materials are found, they will be collected, and their location identified.
	• Possible flooding of downstream areas due to the dewatering of Côté Lake and diversion of the streams.	• It was clarified that the water would be discharged into the Mollie River and would flow through the waterbodies downstream including Three Duck Lake.

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
	• Fish removed from Côté Lake could be given to MFN members for food.	• That is an option that IAMGOLD is open to discussing with the MFN.
	• Groundwater springs were not assessed during the previous EA or accounted for as part of the updated project.	• IAMGOLD has carried out baseline investigations at the site. Groundwater well, if they were to exist at the site, would have been identified.
	• Seepage from the Tailings Management Facility would impact downstream water quality and fisheries.	• Seepage from the TMF has the potential to affect receiving waters and fish. However, cyanide will be destroyed, and the tailings do not have the potential to generate acid. In addition, the TMF is designed to minimize seepage. IAMGOLD has modelled receiving water quality and has identified that water quality guidelines will be met, and that fish will not be harmed due to seepage from the TMF.
	• Will the fish adapt to the new lake and continue to thrive?	• Yes, the realignment channels and the new lake are being designed by specialists in a manner such that they will be suitable for local fish species.
Archaeology	• What do you mean by “discussion” about curation of archaeological artifacts?	• The Ministry of Tourism, Culture and Sport is working on their processes and the discussion will focus on access to artifacts – the best way to store them, make them available for display and make them accessible for researchers in future.
	• Why does the Ministry of Culture need to be in charge of the artifacts if they belong to us as part of our history?	• The Ministry of Culture needs to keep all records of artifacts found for the purpose of education and so they aren’t lost as others have been.
	• Concern over including a ceremonial component to the removal and storage of artifacts. This would need community feedback.	• The Artifacts Coordinator will be looking to the community for feedback on this aspect of the storage of artifacts. The artifacts will be transferred to Mattagami First Nation for storage and care.
	• How will the artifacts be stored so we can see them? Our children should be able to hold them and learn about them.	• IAMGOLD supported the hiring of an Artifacts Coordinator at MFN to oversee this element of the Project and work towards the creation of a display facility. A questionnaire will also go out to members of the community for input as to how they would like to see the artifacts displayed and cared for.

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
	• There was discussion about who licenses archaeologists (the provincial government) and the protocols for artifacts that could be in the bottom of Côté Lake.	• It was clarified that there must be a First Nation monitor present during gradual dewatering of Côté Lake and a licensed archaeologist will document any artifacts that are uncovered. • MFN is currently working with Ontario Power Generation (OPG) and IAMGOLD on a plan to store and display the thousands of artifacts that have been found over the past five years on the Project site and the Mattagami Lake Dam site.
Environment and Environmental Assessment Process	• There is a need for a plain language presentation of "Mining 101" basics.	• IAMGOLD will continue to work with the communities to build their knowledge of mining fundamentals.
	• Will there be First Nation presence during the de-watering process?	• During the dewatering, which is done in stages, an archaeologist and a FN representative will be present.
	• There is an interest in having an MFN monitor on site for monitoring impacts to fish, water quality.	• IAMGOLD is committed to support employment for local community members (First Nation, Métis communities and Gogama), including opportunities to support environmental monitoring activities.
	• What is de-watering?	• This is the removal of water from Côté Lake. It will be done in stages / levels during which a biologist will be present to monitor the capture and proper care of any aquatic life found and an archaeologist will be present to determine if there are any artifacts in the bed of the lake.
Shining Tree Transmission Line	• MFN and their environmental advisors were not previously aware of the need for a provincial class EA in relation to the 44 km section of the transmission line from Shining Tree to the Project site.	• Any work to review the Class EA is out of the current scope of services funded by IAMGOLD for MFN and FPFN. In future, notice of commencement of any EA process related to the Project must come in advance of them being placed in local newsletters. A scope change will be prepared to financially support review of the Environmental Screening Report (ESR).
	• Concerns were raised about potential impacts to Indigenous traditional land uses from the construction and ongoing operation/maintenance of the transmission line.	• The spatial data for the project footprint as well as the transmission line corridors has been requested from IAMGOLD/Wood so that an initial investigation of the potential impacts on Indigenous uses of the corridor and surrounds may be undertaken to inform the ESR and help determine appropriate mitigation, management and accommodations for any potential impacts.

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
	• Use of chemical sprays to manage vegetation along the transmission line corridor and in particular near water crossings was a concern.	• IAMGOLD remains committed to the use of mechanical clearing for clearing and managing vegetation along the transmission line corridor, as committed to in the EA and as per the federal condition of approval (5.1).
	• MFN needs to know if a system (supply capacity) assessment has been completed and what impacts, if any, there will be on the supply of power to the community. There is a concern that there could be an increase in service charges for power to community members as a result of the power line upgrades.	• It was clarified that the costs to upgrade the power transmission line is borne solely by IAMGOLD.
	• Is the 44-km transmission line part of the Environmental Effects Review?	• No, it will be looked at through a separate environmental screening process.
	• What/where is the scope for the First Nation to review the EA process on the transmission line?	• The transmission line is subject to the Class EA for Minor Transmission Facilities; it is a two-step process that begins with a screening to determine if further study (Environmental Study Report) is required.
Terrestrial	• There was a concern about disturbance or removal of eagle/raptors nests on the Project site.	• It was clarified that the one eagle's nest near Côté Lake was identified in the previous Environmental Assessments for the Project and that there is a federal approval condition that the nest not be disturbed or removed without prior consultation with MFN.
Noise	• There is an interest in knowing what noise emissions effects may be from the use of high pressure grinding rolls for ore processing.	• The noise from the use of HPGR has been considered and the result is that the overall project noise levels will be lower compared to the noise levels of the Project using a SAG mill.

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
Land Use	• Are you still doing exploration in the area?	• IAMGOLD is continuing exploration drilling in the areas proposed for the tailings management facility and the mine rock area to ensure that they will not overprint a gold deposit. The regional exploration program is taking place approximately 30-40 km in each direction from the Project site.
Indigenous plant use	• There was a concern that traditional medicines were not assessed during the previous EA or accounted for as part of the updated project.	• IAMGOLD remains committed to the EA commitment in which IAMGOLD will continue to discuss potential Project effects on traditional activities with potentially affected Indigenous communities throughout the life the Project. Should additional information regarding a community's traditional practices become available, IAMGOLD will review and consider any potential effects, and develop and implement necessary mitigation measures, as appropriate.
Socio-economic	• First Nation members need to be priority on hiring.	• IAMGOLD is committed to support employment for local community members (First Nation, Métis communities and Gogama), including opportunities to support environmental monitoring activities.
Closure	• Why will the new lake disappear post-closure? We want it to remain once established.	• This comment is noted, IAMGOLD will investigate options to maintain New Lake post-closure.
	• Will the area be monitored after closure to ensure the environment will continue to be protected?	• Yes, the area will be monitored for a long period of time after closure.
	• Mine site must be remediated to pre-development (or better) environmental conditions.	• IAMGOLD has prepared a Closure Plan that is fully compliant with applicable regulations and guidelines. IAMGOLD will continue to consult with stakeholders on potential post-closure uses of the site,
	• The importance of ceremony at Closure was noted.	• IAMGOLD is open to such a ceremony.

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
Flying Post First Nation		
Traditional Land Use	• Pleased with smaller footprint and that the TMF will no longer overprint Bagsverd Creek.	• IAMGOLD considered comments received during the EA process in designing the optimized Project.
Socio-economic	• Employment.	• Construction is anticipated to begin in 2019. • The Project anticipates a 17-year mine life.
	• Pleased that there will be an on-site accommodations camp / rotational work force.	• NA
	• Interest in having First Nation employees working at site to teach other employees and managers about the land and its importance to First Nations.	• IAMGOLD will develop a cultural awareness training program with input from First Nations and Métis and will require employees and contractors to complete the training.
Métis Nation of Ontario		
Traditional Land Use	• Pleased to see the removal of the Cross-Country TLA	• IAMGOLD considered the MNO TK/TLU Study in the Project optimizations.

Table 2-7 presents a summary of comments received from the public or other stakeholders during the preparation of the EER.

Table 2-7: Summary of Comments – Public and Other Stakeholders

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
Aquatic Biology	• Concern about effects of mercury.	• IAMGOLD is committed to removing all vegetation and organic soils in areas that may be flooded.
Hydrology and Climate	• TMF dam safety.	• The TMF is designed to be remain as dry as possible. The water will filter through the dams and will be directed to the reclaim pond. A climate change assessment was completed as part of the EA and this was taken into account in the current Project design.

Topic(s)	Comment / Concern	Response / How has the comment been addressed?
Noise / Land Use	• Potential noise effects at cottages.	• IAMGOLD presented figures during May / June open houses showing modelled noise effects for daytime and nighttime during construction and operations at various receptor locations, including cottages.
Land Use	• Mesomikenda cottagers expressed happiness with movement of TMF location.	• NA
	• Site access.	• IAMGOLD presented a figure showing proposed access routes for land users during the May / June open houses.
	• Access for Schist Lake cottagers.	• IAMGOLD will continue to work with Schist Lake cottagers to develop a safe and suitable alternate access route.
	• Trapline near the Shining Tree TLA.	• IAMGOLD will work with the MNRF to distribute information about the proposed Shining Tree TLA to trapline holders.
Socio-economic	• Interest in employment and business opportunities.	• IAMGOLD remains committed to providing contracting, employment and training opportunities. • IAMGOLD encouraged individuals to register on their careers webpage (www.iamgold.com/careers).
	• Number of workers required during construction and operations.	• There will be approximately 1,000 to 1,200 jobs during construction and 400 to 500 during operations.
	• Workforce accommodations; interest in seeing Gogama population grow.	• IAMGOLD will have on-site accommodations to house construction and operations workforces. • IAMGOLD is happy to work with Gogama to understand and address potential Project-related socio-economic effects.
	• Concern about TLA affecting power in Gogama.	• The Ontario Energy Board process will include a system impact assessment.
Closure	• What will happen to the site at closure?	• IAMGOLD is looking for feedback about future uses for the site.

In addition to the comments noted above, many positive comments were received about the Project optimizations including:

- Previous concerns were addressed through the optimizations;
- removal of the Cross-Country TLA from the Project design;
- new 44 km transmission line is a considered a better route;
- relocation of the TMF away from Mesomikenda Lake;
- TMF no longer overprinting Bagsverd Creek as it is good turtle habitat; and
- new discharge location.

Several stakeholders indicated that their previous concerns have been addressed through the Project optimizations.

2.6 Review of Updated Technical Memoranda

IAMGOLD continues to work with Mattagami First Nation and Flying Post First Nation on their review of the technical aspects of the EER and will continue to respond to any questions or concerns that they or other Indigenous communities or other stakeholders may have regarding the Project. IAMGOLD met with representatives of the two communities on June 26, 2018 to review several items, including preliminary comments and questions related to the draft Updated Technical Memoranda (UTM) which were previously shared with the communities and their technical consultants. Technical reviewers for Mattagami First Nation and Flying Post First Nation submitted preliminary written comments / concerns to IAMGOLD on July 6, 2018. Responses to the preliminary comments are contained in Appendix A-5 and, where applicable, the EER and UTMs have been updated accordingly.

2.7 Status of Agreements

A Process and Funding Agreement has been reached between IAMGOLD, Mattagami First Nation and Flying Post First Nation related to the communities' involvement through the review of the EER and required regulatory permit applications to advance the Project. IAMGOLD continues to negotiate Impact Benefit Agreements with Mattagami First Nation, Flying Post First Nation and the Métis Nation of Ontario (Region 3), with approximately 25 negotiation meetings occurring between January 1, 2017 and mid-July 2018. The details of the negotiations are confidential, as per the agreement of all parties involved.

3.0 UPDATED PROJECT DESCRIPTION

This chapter provides a description of the optimized Côté Gold Project (the Project) as currently proposed by the IAMGOLD Corporation (IAMGOLD). The location of the Project, overview and site layout are presented in Chapter 1 (see Figures 1-1 and 1-2 respectively). Table 3-1 presents the key Project details for the EA and the EER. Figure 3-1 presents the changes to the Project footprint compared to the EA site layout.

Table 3-1: Côté Gold Project Details - EA and the Project

Component	Previous Project Design (EA)	Current Project Design (EER)
Total Footprint	1,700 ha (17 km^2)	1,050 ha (10.5 km^2)
Life of Mine	15 years	17 years
Open Pit		
Footprint:	210 ha (2.1 km^2)	145 ha (1.45 km^2)
Depth:	550 m	550 m (approximately)
Overburden	20 Mt	11 Mt
Ore	261 Mt	200 Mt
Mine Rock Area		
Footprint	400 ha (4.0 km^2)	300 ha (3.0 km^2)
Quantity	850 Mt	559 Mt
Stockpile slope	2.6H:1V	2.6H:1V
Minimum Factors of Safety (FS)	• long-term static loading conditions FS = 1.5; • short-term at end of construction FS = 1.3; and • pseudo-static FS = 1.0.	• long-term static loading conditions FS = 1.5; • short-term at end of construction FS = 1.3; and • pseudo-static FS = 1.1.
Processing		
Ore Processing Rate:	60,000 tpd	36,000 tpd
Comminution	Two semi-autogenous grinding (SAG) mills	High pressure grinding rolls (HPGR)
Cyanide Rate	0.33 kg CN / tonne of ore feed	0.33 kg CN / tonne of ore feed
Tailings Management Facility		
Deposition Method	Conventional slurry (~40-50% solids)	Thickened tailings (60-62% solids)
Location	4.5 km north of open pit (overprinting portions of Bagsverd Creek)	2.8 km northwest of open pit (between Moore Lake and Clam Lake)
Footprint	840 ha (8.4 km^2)	478 ha (4.8 km^2)
Storage Capacity	261 Mt (193 Mm^3)	200 Mt (130 Mm^3)
Maximum Dam Height	45 m	70 m
Dam Design Criteria (flood)	Not specified	Store 1:100 year flood

Component	Previous Project Design (EA)	Current Project Design (EER)
Dam Design Criteria (FS)	• short-term, end of construction FS = 1.3, • long-term, end of construction FS = 1.5, and • pseudo-static loading FS = >1.0.	• short-term, end of construction FS = 1.3, • long-term, static condition FS = 1.5, and • pseudo-static loading FS = 1.1.
Other		
Site Access	Access from Sultan (Industrial) Road to the south of the Project site	Access from Sultan (Industrial) Road to the south of the Project site
Water Intake Location	Mesomikenda Lake	Mesomikenda Lake
Water Discharge Location	Bagsverd Creek (Outlet)	Three Duck Lake (Upper)
Emulsion Plant	East of Weeduck Lake	East of Weeduck Lake
Accommodations Complex Location	Northwest of Open Pit	Northeast of Open Pit
Overburden Stockpile	Integrated in Mine Rock Area	Southwest of Open Pit
Watercourse Realignments	7.9 km (7 realignments)	2.4 km (2 realignments)
Transmission Line Alignment	230 kV cross-country transmission alignment from Timmins (approximately 120 km)	115 kV transmission line alignment from Shining Tree (44 km)
Water Management Concept	Closed Loop	Closed Loop

Ongoing exploration activities during the preparation of the Feasibility Studies have indicated, that, in the long-term, there may be potential for Project expansion. These opportunities may be pursued in the future, during the Operations phase of the Project, and would be subject to environmental permitting and approvals.

3.1 Main Project Components and Activities

The preliminary site layout places the required mine related facilities in close proximity to the proposed open pit, to the extent practicable, primarily on private, patented lands owned fully and / or jointly by IAMGOLD. The site plan for the Project is shown in Figure 1-2. The optimized Project footprint, excluding the transmission line alignment (TLA) ROW will cover approximately 1,050 hectares (ha), or 10.5 square kilometres (km^2) during operations. The proposed TLA is shown in Figure 3-2.

The site plan reflects the Project areas of proposed development rather than actual detailed design features. The locations and scale of some Project components could be optimized as

engineering studies progress and further consultation with the general public, Indigenous groups (First Nation and Métis) and government agencies occurs.

The Project is designed to:

- Respect the interests of other land uses and users in the area;
- use well-known, conventional and environmentally sound mining and processing technologies commonly used in northern Ontario, based on IAMGOLD's experience with other gold mining operations;
- minimize the overall development footprint and associated potential effects;
- manage water effectively and efficiently;
- mitigate or compensate for effects on fish and fish habitat; and
- accommodate effective planning for final closure and site abandonment, rendering the site suitable for other land uses and functions compatible with the post-closure landscape.

3.2 Existing Facilities and Infrastructure

The Project site and surrounding area are mainly characterized by gentle hills, forests, lakes, and rivers. Land use in the general area consists of recreational activities by local residents and tourists, including fishing, camping, and hunting. It is also extensively used for sustainable harvesting of timber.

As the Project site is an active exploration area, there are a number of exploration-related facilities, such as drill pads and associated equipment, used to define the current mineral resource as well as to investigate soil and groundwater conditions.

Mineral exploration of the Project site has been carried out since about 1900 by various companies and government agencies and has continued sporadically to the present time. More concerted mineral exploration efforts were conducted in the early 1940's and from the early 1970's to about 1990 when an existing shaft on the Project site was allowed to flood, subsequently capped and no further underground work was undertaken. Since its discovery in 2010, extensive exploration drilling activities have been undertaken to delineate the Côté Gold deposit. As of December 31, 2015, the Côté Gold drill hole database contains results of 536 diamond drill holes for a total of 273,475 m.

3.3 Open Pit Mine

3.3.1 Open Pit Design

The current design proposes a final open pit measuring approximately 145 ha (1.45 km^2) with a depth of approximately 550 m. Open pit mining operations will facilitate ore processing rates of

approximately 36,000 tpd. Extraction of the ore through pit development will result in the production of an estimated 11 million tonnes (Mt) of overburden and 559 Mt of mine rock. Open pit mining and ore processing will occur over a 17-year period.

The pit wall slopes will be designed for safety based on applicable industry standards. The benches will be developed by blasting utilizing industry standard and NRC approved products depending on the rock formation and shot requirements. Run off from blast holes in the open pit will be managed by creating a sump or sumps at the base of the pit for collection. Additional water management options, such as perimeter drains, in-pit wells and weep holes in the pit walls, may be investigated.

3.3.2 Site Preparation

Before mining of ore commences in the Project open pit, a series of activities must first occur:

- Progressive clearing of merchantable timber and grubbing;
- initiation of overburden stripping;
- establishment of water management and flood protection infrastructure;
- construction of dams and water realignment channels/ditches; and
- construction of support buildings and infrastructure.

3.3.2.1 Overburden Stripping

Overburden removal (stripping) will be conducted to gain access to the bedrock and allow extraction of ore. Project development is expected to generate approximately 11 Mt of overburden, which will be stockpiled for permanent disposal on site, with a portion of the overburden used for site reclamation activities.

At the proposed open pit location, overburden ranges from approximately 0.1 m (exposed bedrock) in the higher elevation areas to 22 m thick in low-lying areas, averaging a depth of 7.7 m over most of the proposed open pit area. Overburden will be stripped progressively from the pit surface from the start of the construction phase until the start of operations. It will be excavated using diesel and electric shovels, excavators, dozers and/or comparable equipment, and will be transported by haul truck to the overburden stockpile; alternatively, it will be trucked directly to the applicable construction site (e.g., to the water realignment channel) if intended for re-use.

3.3.2.2 Surface and Mine Water Management

To develop the open pit, Côté Lake will need to be dewatered. In addition, portions of Three Duck Lake (Upper), Clam and Little Clam Lakes and the Mollie River system will be dammed,

overprinted, or will require realignment to allow safe operation of the open pit, TMF, and other Project components. Additional information is provided in Section 3.10.7.

Dewatering in the open pit area will start during the Construction phase and will continue throughout the Operations phase. Surface water runoff will be diverted from entering the open pit by damming, ditching or other means. This will reduce the quantity of water flowing over the overburden slopes and the quantity of water interacting with mining operations. Runoff and seepage will be diverted to the mine water pond. Water collected within the open pit sump (e.g., from direct precipitation, overburden seepage and groundwater inflow) will be pumped from the pit base to the surface for transfer to the mine water pond. During the Construction phase, water from the open pit area may be pumped to the TMF to provide water for the ore processing start-up.

During operations, water from the open pit sumps will form part of the recycled water used to help satisfy the water requirements for the ore processing plant. Management of mine water from the pit is further discussed in Section 3.4.

3.3.3 Open Pit Mining

The mining method will be a conventional shovel and truck type operation.

The open pit mine is currently expected to operate on the basis of two 12-hour shifts, 365 days per year, with an ore processing rate of 36,000 tpd. The mine life is expected to be approximately 17 years. Rock will be broken at the face using explosives and will be loaded using a hydraulic shovel onto off-highway haul trucks for transport to the primary crusher or to the appropriate stockpile. Ramp widths will be designed to accommodate the necessary heavy equipment.

Approximately 0.33 kg of explosives is expected to be consumed for each tonne of ore and 0.25 kg for each tonne of mine rock mined. Blasting will be carried out five times per week during normal operations. A maximum blast charge per delay of approximately 536 kg has been determined for the open pit during normal operations. Dust control measures will be implemented during all phases of the Project, as required. Storage and preparation of explosives is further detailed in Section 3.11.1.

The primary mining fleet will consist of rotary blast hole drill rigs, crushers, mining hydraulic shovels, loaders and 220 t haul trucks. Dozers, graders, auxiliary excavators and other miscellaneous support equipment will support the fleet.

In total, an estimated 200 Mt of ore will be mined from the open pit and processed on-site over the Project life. A portion of this quantity is low-grade material that will be stockpiled northeast of the open pit for processing later in the mine life but will be depleted prior to closure.

3.3.4 Open Pit Material Geochemical Characterization

A total of 35 selected overburden materials have been characterized from the EA open pit area and remain directly applicable to the Project open pit as EA and the Project open pit footprints are essentially the same (refer to Appendix B-1). The following are key findings of the characterization work completed:

- Open pit overburden materials generally do not have a net potential for acid rock drainage (ARD);
- generally low concentrations of total sulphur (<0.03%) were observed with mostly similar proportions of sulphate and sulphide;
- a maximum sulphide content of 0.05% was observed;
- some shallow (<0.9 m depth) soil samples are neutralization potential (NP) depleted (negative NP and depressed paste pH) presumably due to weathering exposure at surface;
- a wide range in NP predominantly as carbonate is present in pit overburden materials (in the order of <1 to more than 200 kg $CaCO_3$/t);
- no potentially acid generating (PAG) samples were identified on the basis of NP Ratio (NPR) <2; and
- exceedance of the Ontario Typical Range agricultural standards for copper in four of 35 samples (three samples also exceeded the residential, parkland, commercial and industrial (R/P/C/I) standard).

Five selected sediment materials have been characterized from the following four lakes in the region of the future proposed open pit: Clam Lake, Côté Lake, Three Duck Lakes and Unnamed Pond. The following are key findings of the characterization work completed:

- The sediment materials exhibit a low potential for ARD;
- generally low concentrations of total sulphur (<0.07%) variably mixed in proportion as sulphate and sulphide were identified in the sediments;
- a maximum sulphide content of 0.05% was present in an organic rich, high NP Côté Lake sediment sample;
- a wide range in NP predominantly as carbonate was observed from site to site (in the order of 1 to just under 150 kg $CaCO_3$/t);
- there is a generally low potential for ARD from these materials and no PAG samples were identified on the basis of NPR <2 or Carbonate NPR <2; and
- exceedance of the Ontario Typical Range Sediment copper standard for three of the five samples with two of these also marginally exceeding the sediment standard for nickel.

An extensive characterization program of mine rock was completed for the EA. An updated evaluation of the previous samples within the optimized open pit have identified that metal leaching (ML) / acid rock drainage (ARD) results remain comparable to previous study findings (refer to Appendix B-1). The only notable change in mine plan has been the potential exclusion of diabase from ore processing (<1% additional diabase to the MRA). This change has been considered and is not expected to have an effect on the ML / ARD characteristics of the MRA (refer to Appendix B-1). The key findings of the characterization work are summarized below.

ARD potential

- Most mine rock sampled exhibited little potential for ML / ARD;
- generally low concentrations of total sulphur (<0.24% at 90th percentile) predominantly as sulphide are observed;
- the maximum reported sulphide content was 1.4% and the most commonly observed sulphide is pyrite;
- the materials exhibit a wide range in NP predominantly as carbonate (in the order of 1 to 450 kg $CaCO_3$/t);
- calcite is the most commonly observed carbonate mineral with lesser amounts of dolomite and sometimes ankerite identified;
- most samples are non-potentially acid generating (NAG; NPR >2), mean NPR of the mine rock was 19;
- a proxy approach using Leco C and S[2] analysis to estimate NP and maximum potential acidity (MPA) was proven to be reasonable as a stream-lined approach to guide future ARD characterization work for Project mine rock;
- analysis of available samples within the updated pit shell identified that sufficient samples representing all lithologies continue to be represented within the smaller revised pit shell and included 196 ABA analyses and 835 expanded data set samples;
- approximately 6% of acid base accounting (ABA; reference) samples were PAG based on NPR <2 and 7% of ABA samples were PAG based on NPR_{MPA} <2;
- approximately 5% of Leco carbon/sulphur samples (835 sample expanded data set) were PAG based on NPR_{MPA} <2, which is unchanged from characterization of detailed in the EA; and
- a small sub-set of the ABA (reference) samples have been identified with low NP (<10 kg $CaCO_3$/t) that may contain Fe carbonates that are not well characterized by the proxy approach using Leco C and S. All but one of these samples contained very low sulphide content.

[2] Leco carbon (C) and sulphur (S) induction furnace method for analysing total carbon/sulphur present in samples.

Considering the limited proportion of PAG samples identified, the overall low sulphide content of the rock, and the prevalence of potentially NAG rock to be produced as waste, the likelihood of net acid conditions occurring in the mine rock piles is considered to be very low. Therefore, the inclusion of any PAG materials with the bulk of the waste will be an appropriate management method. As such, segregation of PAG materials is neither practical nor necessary.

ML Potential

- A number of samples exceeded the 10 times crustal abundance screening criteria for arsenic, bismuth, copper and selenium;
- a few samples exceeded the 10 times crustal abundance screening criteria for cadmium and molybdenum respectively;
- available data suggests a generally low potential for ML;
- all short-term ML results were below Ontario Regulation 560/94 threshold values;
- a few elements (most frequently vanadium, silver, chromium and copper) in some samples were detected in short term leach test results above the Provincial Water Quality Objectives (PWQO) screening criteria;
- field cells, initiated in 2013 and continue to be monitored, have thus far identified steady trends in metals that were low and generally below PWQO screening values with uranium noted to be marginally above the interim PWQO value in isolated samples in the most recent two years of testing (2016 and 2017);
- most trace elements (including silver, beryllium, bismuth, cadmium, chromium, iron, mercury, lithium, nickel, phosphorus, lead, selenium, titanium, thallium, thorium, tungsten and zinc) were at or below detection limits in all humidity cell leachates; and
- arsenic, antimony and molybdenum (that can tend to be mobile at neutral pH) were detected at low levels in some humidity cell leachates and copper was detected in leachate only from one PAG cell based on NPR <2.

3.4 Mine Water Management

Mine water will accumulate during open pit mining operations; and its removal from the open pit will be required continuously for the life of the Project to maintain a dry working environment.

The proposed open pit will intercept groundwater and runoff from adjacent areas, as well as direct precipitation. Potential inflows from overburden seepage are anticipated to be intercepted by ditches at the surface before entering the open pit.

The average annual precipitation over the Project site is approximately 856.3 mm. In a 1:50 year wet annual climate condition, the Project site is projected to receive up to approximately 1,008 mm total annual precipitation (i.e., approximately 150 mm more than the average annual

precipitation). In a 1:25 year wet annual condition, total annual precipitation is projected to be approximately 990 mm, and in a 1:10 year wet annual condition up to approximately 959 mm. The probable maximum precipitation (PMP) over 24 h would be up to approximately 506 mm over a 25 km^2 drainage area.

Mine water will be collected in a series of drains and / or sumps at the base of the open pit, which will be progressively relocated as the pit develops over time. Mine water from the fully developed open pit and overburden seepage from the pit perimeter drainage will be pumped to the mine water pond. During construction, water from the open pit may be pumped to the TMF to provide water for the ore processing start-up. During the Operations phase, water from the mine water pond will be pumped to the ore processing plant as needed, and the remainder of the flow will be sent directly to the Polishing Pond. No special handling or treatment of snow is considered as accumulated snow in the pit will be removed with the excavated mined materials (overburden, mine rock or ore), or will melt and drain towards the installed sumps.

Mine water is expected to contain suspended solids from general mining and earth moving activities, as well as blasting product residuals. Low quantities of residual ammonia, hydrocarbons and nitrate can be present following detonation of blasting products. Weather conditions, along with rock foundation type can influence blasting requirements and potential residuals, and will be managed in line with best management practices. Mine water runoff will be captured and monitored as appropriate to reduce the potential for release. Hydrocarbon residuals can be present due to hydraulic hose failures, fuel leaks and similar mishaps. Measures will be taken to prevent and clean up any hydrocarbon spills to prevent mixing and surficial infiltration. Leaching of the exposed bedrock within the open pit may also potentially contribute minor quantities of solid and dissolved phase metals to the mine water. Because of the slow kinetics of mineral oxidation, metals are expected to occur mostly as solid metals.

Ammonia-based residuals will be managed at source through good industry practice for explosives handling and use, and through extended effluent aging in the Polishing Pond. Pumping mine water from below the sump surface will help keep any hydrocarbon residuals from being pumped to the mine water pond. Hydrocarbon collected in the sumps will be periodically removed as required using oil skimmers and / or similar absorbent materials. The absorbent materials will be appropriately handled and disposed of.

Mine water management during the Post-closure period and general water and drainage management are discussed in Section 3.16.

3.5 Stockpiles

The principle criteria for selection of the stockpile locations are the following:

- Areas within reasonably close proximity to the open pit to minimize the overall Project environmental footprint, to reduce greenhouse gas (GHG) emissions and to achieve economic efficiencies of operations;
- limit the number of stockpiles – establish fewer but larger stockpiles that can be managed more efficiently, rather than having many smaller, scattered stockpiles;
- select areas with suitable foundation conditions;
- minimize adverse effects on visual aesthetics by limiting stockpile height;
- select areas within a safe distance from water bodies, creeks and fish habitats (maintain 100 m to 150 m distance where possible);
- position stockpiles in a manner such that drainage from the stockpiles can be suitably collected and managed in accordance with the Federal Metal Mining Effluent Regulations (MMER)[3] and Provincial Environmental Compliance Approval requirements;
- stockpiles should be at least 150 m from the open pit perimeter;
- minimize potential adverse effects to aquatic and terrestrial habitats, including potential adverse effects to species at risk (SAR);
- in the case of mine rock, provide for an optimal closure scenario for potential ARD / ML management using passive systems to the extent possible, but with a contingency arrangement for chemical treatment if and where required; and
- land tenure and existing / potential land uses, including proximity to existing residences / cottages as potential noise receptors.

Based on these criteria, surface locations for potential separate stockpiles were selected (see Figure 1-2). It is anticipated that final stockpile heights could be up to a maximum of 150 m depending on the stockpile footprint and other factors.

3.5.1 Mine Rock Area

Project development is expected to generate approximately 559 Mt of mine rock, and mine rock stockpiles will be located in the designated MRA covering an estimated total area of 300 ha (3.0 km^2), with an ultimate elevation of approximately 520 masl. Based on the current

[3] It is noted that during the time of writing, the Metal Mining Effluent Regulations (MMER) was amended to the Metal and Diamond Mining Effluent Regulations (MDMER). MMER has been used throughout this document for the sake of simplicity.

design, approximately 100 Mt of mine rock is expected to be used in various Project site construction activities, mainly for the TMF dam and road maintenance and construction.

The MRA will be developed over the life of the Project, with a final overall slope of approximately 2.6 m horizontal width to 1 m vertical height (2.6H:1V). The stockpile layout will include 10 m tall benches with inter-bench slopes at 1.3H:1V and 12.8 m wide mid-slope benches. Overburden present in the proposed MRA area has an average thickness of 9.3 m, with the greatest thickness of 22.6 m observed on the western shore of Three Duck Lake (Middle), similar to overburden conditions of the open pit area.

The stability of the MRA stockpiles will meet or exceed the following minimum safety factors:

- Long-term static loading conditions Factor of Safety (FS) = 1.5;
- short-term at end of construction FS = 1.3; and
- pseudo-static FS = 1.1.

Ditches and seepage collections ponds will be placed around the MRA to capture runoff and seepage for water management and monitoring of runoff quality. The collected water will be directed through the seepage collection ponds towards the mine water pond. The system will be designed to collect the average annual precipitation seepage and runoff, with storage capacity to allow for pumping water to the mine water pond and then to the ore processing plant and / or polishing pond under all climatic conditions.

In general, the rock analyzed to date is considered primarily NAG. Upon closure, MRA drainage will be directed into the open pit, as needed, to facilitate open pit flooding and be managed as part of the open pit catchment area water management program.

3.5.2 Overburden

Overburden will include topsoil, peat and any organic materials encountered during stripping for mine development. The overburden stockpile will be located southwest of the open pit to provide overburden for reclamation and closure activities. The overburden stockpile is designed to have a capacity for 11 Mt of overburden, and to store additional overburden from Project development. Additional temporary overburden storage locations may be used during the Construction phase within the footprint of the TMF or MRA.

Overburden slopes are expected to have an overall angle range of 3 m horizontal width to 1 m vertical height (3H:1V), with benches that are 10 m high and 16.7 m wide. The slopes may be progressively revegetated to promote long-term stability and protect them from erosion; this is expected to meet or exceed the same safety factors as for the mine rock area. The slopes may be further protected from erosion by placing NAG mine rock armouring, as necessary. Ditches will be placed around the overburden stockpile to capture runoff for water management and

monitoring of contact water quality. Runoff will be directed to collection ponds as part of overburden stockpile water management. Water will either be directed to the mine water pond for use in the ore processing plant, or discharged to the environment if water meets discharge criteria.

3.5.3 Medium and Low-Grade Ore and Other Stockpiles

Medium and low-grade ore will be stockpiled for use in future ore processing towards the end of the Project Operations phase. The stockpile area is located northeast of the open pit perimeter and east of the primary crusher and the ore processing plant (see Figure 1-2). This location was selected in consideration of its geological setting (i.e., bedrock is close to the surface) and to minimize transportation requirements. Also, the planned construction of a retention dam required to keep Three Duck Lake (Upper) at a safe setback distance from the open pit exposes this suitable area. The medium and low-grade ore stockpile area is designed to accommodate a maximum quantity of 30 Mt.

Runoff and seepage will be collected and managed similarly to the MRA water management described in Section 3.5.1.

A run-of-mine (ROM) stockpile will provide continuous feed to the ore processing plant. The ROM stockpile will be placed adjacent to the primary crusher to provide the ore material feed to the ore processing plant during operations.

3.6 Processing

Based on the metallurgical test work to date, the ore processing plant will utilize gravity separation and cyanidation for gold recovery. As shown in Figure 1-2, it is currently foreseen that the ore processing plant and crusher circuit will be located in a relatively flat area close to the open pit and the TMF in order to minimize transportation distances for ore and tailings and water piping.

Ore processing will involve crushing and grinding, including coarse gold recovery by gravity, cyanide leaching, carbon-in-pulp (CIP) gold recovery, followed by carbon stripping and electrowinning to produce a gold sludge, which will be poured in a doré gold bar using an induction furnace.

Results from ongoing exploration activities indicate that the ore may contain copper levels such that extraction of copper could be viable in the long term. It is therefore foreseen that, in the future, the ore processing plant may be expanded to include a copper recovery circuit. However, this copper recovery circuit is not included in the scope of the Project as it is not considered feasible at this time.

3.6.1 Buildings and Structures

The ore will be reduced in size by the crusher circuit and processed in the ore processing plant. The ore processing plant and supporting crusher have been designed to meet the estimated throughput processing rate of approximately 36,000 tpd.

The crusher circuit includes the primary crusher, screen, secondary crusher and ROM stockpile with its associated conveying system.

The primary crusher will be located on bedrock outside and adjacent to the ore processing plant, near the open pit exit ramp. The primary crusher building will be built on bedrock and/or appropriately designed concrete pad to ensure equipment stability, with perimeter ditching to capture runoff to be pumped to the mine water pond. In order to prevent uphill haulage, the ore crusher pocket for the processing plant will be below grade and designed with sufficient space for truck cycling to prevent heavy vehicle interaction. The primary crusher building will house the primary and secondary crushers, surge pocket, and apron feeder. Ore will be fed into the primary crusher dump pocket via haul trucks directly from the open pit, or from the ROM stockpile.

All ore processing will take place within the ore processing plant which will also be situated on bedrock and / or appropriately designed concrete pad to ensure equipment stability. The ore processing plant will house comminution, gravity separation circuit, cyanide leaching with CIP gold adsorption, carbon stripping and electrowinning and refining areas, as well as reagent preparation areas and the metallurgical laboratory.

Water will be supplied to the ore processing plant from the mine water Pond, the Reclaim Pond, the Polishing Pond and Mesomikenda Lake. Water sources and recycling are discussed in Section 3.10.

The tailing thickeners, leach tanks, lime slaking and cyanide destruction areas are anticipated to be located outside and adjacent to the ore processing plant. Adequate equipment and handling procedures will ensure that cyanide and other reagents are stored and used safely, as is standard for Ontario gold mines.

3.6.2 Comminution

The ore feeding into the crushing circuit from the ROM or ore stockpile must be reduced in size to a consistency similar to that of sand or silt, in order to optimize further ore processing and gold recovery.

Trucks will dump ore into the dump pocket from the open pit, ROM or low-grade ore stockpile. Ore that is too large will be reduced by means of a hydraulic rock breaker at the mouth of the primary gyratory crusher.

The ore will be sequentially reduced in size through a series of steps, anticipated to proceed as follows:

- Crushing
  - Hydraulic rock breaker as needed to reduce oversized ore to enable feed into the primary crusher;
  - primary crushing (gyratory crusher) to reduce the ore feed to 80% passing 164 mm; and
  - secondary crushing (cone crusher) to reduce the ore feed to 80% passing 38 mm.
- Grinding
  - high pressure grinding rolls (HPGR) to reduce the ore feed to 80% passing 2.4 mm; and
  - ball mills to reduce the ore feed to 80% passing 0.1 mm.

3.6.3 Concentration and Separation

The use of gravity separation will minimize the amount of gold to be leached using cyanide, thereby reducing cyanide consumption.

Large and small ore particles suspended in the post-grinding slurry are separated in the cyclones by means of gravity and hydraulic forces. The smaller ore particles, which tend to remain in suspension, are discharged as cyclone overflow to the leaching circuit. The larger and some smaller but dense ore particles separate out and report to the cyclone underflow. The cyclone underflow will be split into two streams: approximately 20% will be diverted to the gravity recovery circuit, and the rest will be fed to the ball mills for further grinding and size reduction.

The ball mill discharge is combined with HPGR screened product, gravity circuit tails and pumped once again to the cyclone cluster. The overflow from the cyclone cluster is fed to the leach circuit by way of the pre-leach thickener.

In the gravity separation circuit, gravity concentration takes advantage of the high specific gravity of gold to separate the heavier gold particles from the less dense rock particles, to produce a concentrate with low mass and a high gold content. The gravity concentrate will then be leached in an intense cyanidation reactor, to produce a pregnant solution laden with gold. The tailings from the gravity separation circuit will be returned to the ball mill circuit.

3.6.4 Leaching and Carbon Adsorption

Cyanide is a technically-proven and cost-effective reagent used for the recovery of gold from gold-bearing ores, and its use is standard practice throughout the industry.

The cyclone overflow from the grinding circuit will report to a high rate thickener and then to two leach trains in parallel for leaching, each equipped with five leach tanks. The tanks will be contained in a bunded concrete slab to provide secondary containment.

While being processed inside the plant, the ore slurry is thickened to approximately 50% solids and then passes through the following stages:

- Leaching of the feed slurry in a series of leach tanks to which process air and sodium cyanide are added, within an alkaline environment (approximately pH 10.5) to keep the cyanide in solution; at lower pH values cyanide will start to volatilize to the atmosphere (and could produce unsafe conditions);
- adsorption of the gold that is dissolved in cyanide solution onto activated carbon in the CIP circuit; the CIP circuit is comprised of seven tanks containing activated carbon;
- transfer of the loaded (gold bearing) carbon from the CIP tanks to the gold recovery circuit; and
- discharge slurry (tailings) from the CIP tanks will be pumped to the cyanide destruction circuit. The detoxified tailings then flow to the tailings thickener. The thickener underflow is pumped to the TMF and the overflow is returned for use in the process plant.

Most of the activated carbon used in the process will be reactivated for use in the CIP circuit. A small fraction of finer activated carbon will form an inert waste, which will be appropriately stored for subsequent disposal.

3.6.4.1 Gold Recovery

The gold recovery circuit will be a secure area with limited access. A conventional or equivalent carbon stripping and electrowinning circuit will be used to recover gold from the loaded activated carbon. The principal recovery steps include:

- Desorption of the washed loaded carbon with a higher strength, pressurized hot caustic cyanide solution, to produce a high strength pregnant (gold bearing) solution;
- electrowinning gold from the pregnant solutions (CIP and gravity circuits), via electrowinning cells operating in series using steel wool cathodes to produce a gold sludge; and
- drying and smelting the electrowinning cathode sludge in an induction furnace to produce doré bars.

The electrowinning circuit has been assumed to recover 99% of gold in solution.

3.6.5 Tailings and Cyanide Use and Destruction

3.6.5.1 Tailings Geochemical Characterization

Tailings are the primary by-product from the ore processing plant. The resulting tailings, containing some residual cyanide and dissolved metals, will be directed to an in-plant cyanide destruction / precipitation circuit.

Based on preliminary geochemical characterization of tailings materials produced in metallurgical testing to date (refer to Appendix B-1), the following are key findings:

- Almost all tailings materials (97%) indicate a low potential for ARD;
- generally low concentrations of total sulphur (<0.3%) predominantly as sulphide are observed;
- the maximum reported sulphide content was 1.9%; and
- the materials exhibit a wide range in NP predominantly as carbonate (in the order of <1 to 450 kg $CaCO_3$/t).

3.6.5.2 Cyanide Use and Destruction

The SO_2/Air process is selected cyanide destruction system for the Project. The SO_2/Air process is an industry standard process that destroys the cyanide, and significantly lowers concentrations of dissolved metals to below effluent criteria as a result of cyanide destruction. These metals then precipitate in the TMF. The tailings will be directed to the TMF via a slurry pipeline.

The cyanide leaching process which will be used in the Project will be designed as per industry practices to meet all conditions for the responsible management and use of cyanide. This includes sodium cyanide transportation and storage, the mixing and use of the reagent in the ore processing plant and the final destruction of cyanide tailings prior to pumping it to the TMF.

Cyanide (sodium cyanide) is dissolved and added to the leach circuit at a steady rate of approximately 0.33 kg of cyanide per tonne of ore feed. During the leaching and CIP process, cyanide will occur as both free cyanide and complexed with heavy metals present in the ore. The cyanide will thus be partially consumed as it reacts with sulphur, oxygen and other metals in the ore. A pre-detoxification thickener will be installed to recycle some of the residual cyanide to the ore processing plant water system.

The tailings slurry will be subjected to in-plant SO_2/Air treatment for cyanide destruction. In-plant SO_2/Air treatment of cyanide and metallo-cyanide complexes involves the following (or equivalent) reactions:

$$CN^- + SO_2(g) + H_2O + O_2(g) \rightarrow CNO^- + H_2SO_4(aq)$$

where copper is used as a catalyst to oxidize the cyanide ion (CN^-) to the cyanate ion (CNO^-), also producing aqueous sulphuric acid (H_2SO_4). Cyanate then reacts with water (hydrolyzes) to form ammonia (NH_3) and carbon dioxide (CO_2) in accordance with the following reaction:

$$CNO^- + 2H_2O \rightarrow OH^- + NH_3 + CO_2$$

Cyanate hydrolyzation is a long-term reaction that takes place mainly in the TMF. Often, sodium metabisulphite ($Na_2S_2O_5$) is used in the process instead of sulphur dioxide (SO_2), but the overall reaction produces a similar result, as per the following:

$$2CN^- + Na_2S_2O_5 + 2O_2(g) + H_2O \rightarrow 2CNO^- + Na_2SO_4 + H_2SO_4$$

Metallo-cyanide complexes are oxidized according to the following general reaction:

$$Metal\ (CN)_{xy}^{-x} + xSO_2(g) + xH_2O + xO_2(g) \rightarrow xCNO^- + xH_2SO_4(aq) + Metal^{y+}$$

The free metal ions are then precipitated by adding lime to form insoluble metal hydroxides, which subsequently become adsorbed onto tailings particle solids, forming less reactive and more environmentally friendly compounds, and will be settled out of the slurry in the TMF. The cyanide destruction will occur in destruction tanks located in a concrete containment area outside the ore processing plant building.

The concentration of cyanide from the SO_2/Air treatment for cyanide destruction is expected to be approximately 2 ppm total cyanide.

3.6.6 Other Reagent Use

The primary chemicals to be used and stored at the Project site are typical of those used in gold mines in Ontario and elsewhere: fuels (diesel, propane gas and gasoline), and process-related chemicals and reagents. A list of anticipated reagent use is detailed in Section 3.13 (see Table 3-2).

Several of these reagents will be used in the ore processing plant and for wastewater treatment. If an equivalent alternative and / or more eco-friendly reagent is available, it may be considered for use if it proves to be cost efficient.

Consumption rates are approximate and based on test work and good industry and operating practices. All process reagents will be stored according to supplier and safety guidance, as discussed in Section 3.13.

3.6.7 Tailings Thickening

Tailings slurry from the cyanide destruction circuit will have a feed slurry density of approximately 50% solids. The tailings slurry will be directed through a thickening process where the feed slurry density of 50% solids will be increased to a target of 60% to 62% solids.

Overflow water from the tailings thickener will be recycled for re-use in the ore processing plant and underflow solids will be sent to the TMF.

3.7 Tailings Management Facility

Tailings deposition and storage is a key component for the operations and long-term closure strategy for the Project.

Following receipt of the EA decision, IAMGOLD acquired mineral rights that surround the original mine footprint from Sanatana Resources, a company which jointly held mineral claims within the Project area. This acquisition enabled IAMGOLD to optimize the land use with respect to siting the TMF and minimizing the environmental footprint of the Project. A new TMF site was selected northwest of the open pit and compared to alternative locations assessed by Knight Piésold (2013), and the location sited in the Bagsverd Creek watershed described in the EA.

The ore processing plant will be constructed north of the open pit. The TMF is located adjacent to the ore processing plant and will cover an area of 478 ha (4.8 km^2, see Figure 1-2). Treated tailings discharged from the ore processing plant will be pumped to the TMF for settling, retention and permanent storage. The TMF is designed as a closed loop system which will pump water from the Reclaim Pond directly to the ore processing plant for reuse. Tailings will be discharged by pipeline from the south, west, and north sides of the TMF to maintain the TMF pond on the east side to simplify management during operating and closure.

The TMF will provide capacity for the storage of approximately 200 Mt (130 Mm^3) of tailings solids over the expected Project life, with potential for expansion should additional mineral resources be delineated during ongoing exploration. TMF designs are supported by information on sub-surface conditions gathered from the geotechnical investigations carried out by Golder Associates in 2014 and 2015 and by Amec Foster Wheeler in 2016.

Tailings were evaluated by Amec Foster Wheeler to assess the potential for metal leaching and acid rock drainage (ML / ARD). It was determined that the tailings are NAG, with a substantial excess of neutralization potential expected. There is little evidence of concern for neutral metal leaching in mine rock or tailings (Appendix B-1).

The TMF dams are classified using both the Canadian Dam Association (CDA) Dam Safety Guidelines (2007; 2013 Revision) and the Ontario Ministry of Natural Resources and Forestry

(MNRF) Classification and Inflow Design Flood Criteria (MNR, 2011a). The following criteria will be used in the geotechnical design of the dam slopes:

- The TMF dams have been classified as 'High' hazard potential based on the risk of potential environmental impact on the surrounding lakes (designed for 'Very High' classification);
- the Project site has a low to moderate seismic risk, with a 0.113 g horizontal peak ground acceleration for a 10,000 year return earthquake, and 0.006 g for a 100 year return earthquake; and
- required minimum Factor of Safety values for the design slopes are:
  - short-term, end of construction; Factor of Safety = 1.3;
  - long-term, static condition; Factor of Safety = 1.5; and
  - pseudo-static condition; Factor of Safety = 1.1.

The TMF dams are also being designed to contain the Environmental Design Flood (EDF), a 1:100-year event (24-hour storm run-off or spring runoff event).

TMF dam designs are subject to ongoing engineering design and optimization. Prior to development of the TMF dams, topsoil and other organic matter, will be stripped from the dam footprint. This topsoil may be used in construction of the channel realignments or may be stockpiled around the TMF footprint where appropriate in low height, small stockpiles, to be used for future closure activities, or transported to the overburden stockpile.

3.7.1 TMF Starter Configuration

Starter dams will be constructed up to approximately 405 masl along the east side (maximum 23 m above the ground surface), and 410 masl along the south and west sides (maximum 20 m above the ground surface). The starter dam will be constructed using mine rock; a temporary crusher may be required, with design criteria and other details to be confirmed during permitting. The crest width of the starter dams will be 38 m to facilitate 220 t mine trucks used for hauling rockfill. The upstream and downstream slopes of the TMF dams will be constructed at 3H:1V and 2.6H:1V respectively. The upstream slopes will be provided with a low permeability high density polyethylene (HDPE) geomembrane liner laid over filter and transition layers placed over coarse mine rock. The TMF pond will be maintained in the TMF impoundment in the initial years of operation and the water circulated to the ore processing plant directly from the TMF pond. Seepage from TMF will be intercepted via the perimeter seepage collection ditches, seepage collection ponds and pumped back to the TMF.

3.7.2 Subsequent and Ultimate Configuration

The TMF perimeter dams will be raised in stages to the required elevations for tailings storage, using centreline construction methods, except in the deepest section of the east dam where

downstream raising of the dam is proposed. A Reclaim Pond will be constructed immediately downstream of the TMF perimeter dams. The perimeter dams will be raised using the pervious dam concept; this involves the placement of filter and transition layers to let water permeate through towards the Reclaim Pond via the seepage collection ditches while tailings solids are retained within the TMF basin. Water from the Reclaim Pond will be pumped to the ore processing plant for reuse. Seepage from the reclaim pond will be intercepted via the perimeter seepage collection ditches and seepage collection pond proposed downstream of the Reclaim Pond and pumped back into the Reclaim Pond. The ultimate TMF dam crest elevation will be 450 to 460 m, with a maximum height of 70 m.

3.7.3 Tailings Conveyance and Deposition

Tailings will be thickened with solids concentration in slurry at 60% to 62% and conveyed from the ore processing plant to the TMF through a 1 kilometre (km) long, double-walled, HDPE tailings delivery pipeline. Tailings will be spigotted from the crest of the embankment and sub-aerially deposited to form a tailings beach slope of 1-2%. This deposition technique requires scheduled rotation of the points of active deposition over a tailings beach to achieve a laminated deposit of thin layers. Use of this technique enhances separation of liquids from solids and produces a clear supernatant pond that can be maintained at a reduced volume. The deposition arrangement will force runoff and supernatant to collect at the east side of the facility, forming the TMF pond. The TMF pond is discussed in further detail in Section 3.10.4 and 3.10.7.

3.8 Access

3.8.1 Off-site Access

The Project site is currently accessed from Highway 144 to the east via the Mesomikenda Lake access road, where the current IAMGOLD accommodation facilities and exploration office are located. IAMGOLD intends on using the Sultan Industrial road to the south of Côté Lake as the dedicated main access road for the Project.

Currently, IAMGOLD shares the use of the “Chester Access Road”, a logging road, with EACOM Timber Corporation under a maintenance and repair Memorandum of Understanding. EACOM owns the rights to the “Chester Access Road”, which is classified as a Primary Road under the Forest Management Plan. The Chester Access Road, under the management of EACOM, will be located on lands leased to the Project. IAMGOLD will facilitate re-routing of EACOM haulage through the Project footprint as infrastructure may overprint some section of the existing road. Public access will be re-routed in consultation with local users and safety considerations. At present, this road is an active haul road in suitable condition and would not require any foreseeable upgrades for alignment or to water crossings for Project use.

3.8.2 On-site Access

Internal haul and service roads, under the management of IAMGOLD, will link the main Project components and will be linked to the existing local road network. Large haul truck roads and

dedicated light vehicle access roads will be kept separate to facilitate mining operations and increase internal road safety.

On-site roads will have nominal travel widths of a minimum of 8 m for light vehicle roads and 38 m for haul roads. Internal ramp widths in the open pit will measure approximately 20 m to 38 m in width, sufficient to accommodate one or two-way traffic of heavy equipment haul trucks and vehicles. The ramp gradient will be maximum 10% on straight sections.

3.9 Aggregates

Most of the construction materials for the Project will be NAG mine rock and overburden waste from developing the open pit. It is estimated that approximately 100 Mt of mine rock will be re-used in site construction.

Additional aggregate materials, such as sand and gravel, will be required for specialized uses including tailings dam filters, concrete manufacturing and road construction. There are currently two aggregate pits (designated as Category 9 – Aggregate Pit on Crown Land, "Pit above Water" - under the *Aggregate Resources Act*) permitted in the vicinity of the Project, and these are shown in Figure 1-2. The resources remaining at these aggregate pits have been verified and contain approximately 500,000 m^3. As additional tailings dam lifts will be required during the mine life, it is anticipated that the mine will provide NAG mine rock for tailings dam construction as well as providing additional haul road aggregate during the winter or high rainfall months. In addition to aggregate sources identified on Figure 1-2, additional material may be taken from the footprint of the Project components, such as the TMF in accordance with the designs. The aggregate sources will be operational during the Construction phase and will be developed on an 'as required' basis with the intent of limiting stockpile areas for large quantities for materials months.

If a quarry or additional pits are required and developed during the Construction and / or Operations phases, these will be progressively rehabilitated and reclaimed according to Provincial approvals and standards; this may include natural flooding to create pond features.

3.10 Water and Drainage Management

The principal water requirements and flows for the Project that will require management include:

- Potable water for consumption and staff washing / showers (the mine dry);
- water for the ore processing plant (start-up and operations);
- water for truck wash facility, sanitary uses and select ore processing plant uses;
- water for dust control;
- mine water from the open pit (i.e., groundwater seepage and direct precipitation);

- water associated with the treated (SO_2/air) tailings effluent, as well as precipitation collected within the TMF;
- overburden seepage from pit perimeter ditch;
- runoff collected at the MRA and ore stockpiles;
- treated domestic sewage water;
- water from truck wash bays and other minor sources; and
- general site area runoff and seepage.

The area and Project site are surrounded by numerous water bodies, including lakes and rivers. The hydrology in the vicinity of the Project is described in the EA and in the Hydrology and Climate Change Updated Technical Memorandum (Appendix B-5).

3.10.1 General Approach

Water management for the Project will be integrated to the extent practicable to:

- Maximize the rate of water reclaim / recycle for use in the ore processing plant;
- select a final effluent discharge point; and
- provide for optimal effluent quality so as to not adversely affect downstream and receiving water systems.

3.10.2 Water Supply for Ore Processing Plant Operations

The primary water reservoir to support the ore processing plant start-up will be the mine water pond which is located adjacent to the ore processing plant. Construction of the mine water pond is planned to start once regulatory approvals are obtained. For the initial start-up, in addition to natural inflows, water may be taken from Mesomikenda Lake and stored in the mine water pond for future use.

The mine water pond will be supplied by water from runoff (drainage) and seepage collection from the open pit, stockpiles and from general site runoff and seepage collection systems. Mesomikenda Lake is also expected to provide a potential source of make-up water for use in the ore processing plant, as needed.

At this time the fresh water removal rate is not expected to be greater than 10% of the process water demand at the ore processing plant, however the maximum fresh water removal rate will be determined during the Permit to Take Water approval process. Fresh water will be taken in accordance with conditions associated with the Permit to Take Water, when approved.

The water recycled from the Reclaim Pond through the reclaim pipeline is proposed to minimize fresh water uptake needs. The Reclaim Pond will receive approximately 15,797 m^3/d of supernatant water. Additional water may be reclaimed from the polishing pond.

Approximately 98% of the process water (the other 2% represents required fresh water) may be derived from the open pit, runoff and seepage collection and supernatant water stored in both the mine water pond and the Reclaim Pond Under typical, average annual operations, it is expected that 19,147 m^3/d of recycled water will be derived from the mine water pond and from the TMF pond, and 360 m^3/d of fresh water from the Mesomikenda Lake (total ore processing plant water demand of 19,507 m^3/d). Enough water will be stored in both the mine water pond and the Reclaim Pond to supply the ore processing plant with water during the winter months or during potential prolonged summer / fall drought conditions. The ore processing plant water discharge to the TMF is estimated to be approximately 817 m^3/h.

The mine water pond will be designed to have a storage capacity of 40,000 m^3. The mine water pond will store water with suspended solids and possibly low levels of dissolved metals, as well as residual ammonia from the use of explosives.

3.10.3 Fresh Water and Other Water Requirements

A small amount of fresh water will be used for specialized ore processing plant functions. The water removal is intended to supplement recycled site water and also provide for truck washing, potable and fire reserve requirements.

Potable water for domestic consumption (i.e., potable water and domestic use such as in kitchen and showers) will be provided by groundwater wells in the vicinity of the Project site. It is estimated that an extra 245 m^3/d of fresh water will be required to meet potable water needs for the ore processing plant and accommodations complex. Outlying areas will be provided with a bottled potable water supply.

Approximately 552 m^3/d of freshwater will also be required for the truck wash facility, which will be located next to the ore processing plant, and other similar uses. Ditching around the truck wash will capture flowing water and runoff, which will be directed to the mine water pond.

Other water needs, either from fresh water or from the mine water pond, are expected to include:

- Water supply for Construction phase activities, including concrete manufacture;
- dust control on site roads and stockpiles (approximately 3,290 m^3/d estimated from the mine water pond); and
- sanitary purposes (sewage).

3.10.4 Tailings Management Facility Water Management

As previously noted, current indications, based on geochemical analyses of rock samples from the proposed open pit, suggest that almost all of tailings will be non-acid generating. Tailings are currently being investigated in more detail to determine their acid generating potential. In addition, open pit, ore processing plant site runoff, MRA and overburden stockpile water management is expected to be integrated with TMF operations. The tailings slurry from the ore processing plant will contain residual cyanide compounds and ammonia (either as a product of cyanidation, or from open pit water reclaimed for use in the ore processing plant). Cyanide is proposed to be treated within the ore processing plant using the SO_2/Air process.

The treated tailings slurry from the ore processing plant will be discharged to the TMF via the tailings slurry pipeline (approximately 1 km in length, double-walled HDPE), where effluent associated with this slurry will be subject to further treatment through natural degradation within the TMF and Reclaim Pond. Due to the natural topography, effluent water separating out through natural degradation within the TMF will accumulate in the eastern part of the TMF (forming the TMF Pond) and will then be pumped to the Reclaim Pond (see Section 3.10.6.1). This water will be used to form part of the process water requirement for the ore processing plant. Tailings solids are settled and residual chemicals in the water column and are passively precipitated, oxidized, taken up through biological processes and / or volatilized to the atmosphere. The tailings will settle for permanent storage of the barren ore solids along with a quantity of water permanently stored within the tailings pore spaces, together with temporary storage of the remaining water portion (supernatant) in the TMF pond and Reclaim Pond for future re-use.

Natural degradation is the removal of contaminants contained in retained water through complementary natural processes, providing an appropriate amount of retention time to allow the reactions to occur. These processes are most effective in warm weather conditions as biophysical activity is optimal, and natural sunlight enhances several natural degradation processes.

Cyanide and metallo-cyanide complexes are inherently unstable. Natural temperature changes and ultraviolet light from the sun break residual cyanide and metallo-cyanide complexes down to simpler, less toxic, more stable compounds. This happens primarily by volatilization of hydrogen cyanide gas at extremely low concentrations to the atmosphere, where it further reacts with oxygen and hydroxyl radicals in the air in the presence of sunlight to form carbon monoxide and nitrous oxide (Lary, 2004). The metal ions left behind in the tailings either reacts with hydroxyl ions, forming insoluble precipitates, or they adsorb onto suspended solids. These solids settle by gravity with other tailings solids, resulting in a clear water tailings management area pond at the surface. This water will be re-used as it is recycled back to the ore processing plant. Residual ammonia will be present in the treated tailings slurry as a result of residue from explosives remaining on ore, and in the ore processing plant treatment process. Additional ammonia is also produced from the SO_2/Air cyanide destruction process, where cyanide is broken down to cyanate which in turn breaks down to ammonia and carbon dioxide. Ammonia is

also broken down through natural degradation, given sufficient retention time. Ammonia is a food source for bacteria and algae and it also volatilizes to the atmosphere.

3.10.5 Final Effluent Quality and Discharge

Water will be discharged from the polishing pond, which is located between the low-grade ore stockpile and Three Duck Lake (Upper). The polishing pond will receive surplus water from the mine water pond, but will receive no direct discharge from the TMF pond or the Reclaim Pond. The polishing pond will provide sufficient retention and holding capacity to allow for water quality levels suitable for discharge in accordance with applicable regulations (MMER SOR/2002 222 and Ontario Regulation 560/94), and the anticipated final effluent concentrations set by the MOECC to protect the receiving water(s). It is expected that a study to determine the assimilative capacity of the receiving water will be carried out as part of the Provincial Environmental Compliance Approval process to determine acceptable effluent loadings that will not compromise aquatic life in the receiving water. These studies may take into account toxicity modifying agents such as water hardness, natural chelating agents (e.g., dissolved organic carbon) receiving water species sensitivities, and potentially other factors. In general, the quality of seepage from the TMF and Reclaim Ponds is also expected to be consistent with these effluent quality requirements.

It is expected that there will be one discharge location to Three Duck Lakes (Upper) near the outlet of the realignment channel.

3.10.6 Water Management Structures

The primary water management structures for the Project include:

- The mine water pond;
- the freshwater pipeline from Mesomikenda Lake to the ore processing plant;
- the reclaim water pipeline from the Reclaim Pond and Polishing Pond to the ore processing plant;
- the tailings slurry pipeline from the ore processing plant to the TMF;
- the seepage collection ponds and ditches for the ore stockpiles, MRA, overburden stockpile and TMF; and
- the Polishing Pond and associated discharge pipeline to the discharge location at Three Duck Lake (Upper).

Fresh water will be taken from Mesomikenda Lake via a single-walled HDPE fresh water pipeline to the ore processing plant. This fresh water pipeline intake will be designed to meet applicable Federal guidelines to prevent the impingement and entrainment of fish.

Water management ponds are described in the following sections. Other water management structures for the Project include the diversion dams and watercourse realignments that will be necessary to accommodate Project components, including the open pit and TMF. These are discussed in Section 3.10.7.

3.10.6.1 Preliminary Pond Designs

Mine Water Pond

The mine water pond will be designed to store up to 40,000 m^3 of mine water. Mine water from the open pit sump will be pumped to the mine water pond at a rate of approximately 270 m^3/h during normal operations. Water will also be pumped to the mine water pond from runoff collection systems around the ore processing plant and site, as well as runoff and seepage collected from the open pit.

Excess water accumulating in the mine water pond will be transferred to the polishing pond via a dedicated pipeline.

Seepage Collection Ponds

Where possible, the collection ponds will be placed along or contained by natural topography. Dams / berms will be aligned in low-lying areas. Where the natural topography is not suitable, dams / berms will be designed in accordance with both CDA (2013) and MNRF (2011a) guidelines similar to the TMF dams.

Seepage collection ponds will be designed to collect runoff and seepage from the ore stockpiles, MRA, overburden stockpile, Polishing Pond, and the TMF. They will be designed with enough storage capacity to allow for storage and pumping water to the mine water pond and / or Polishing Pond year-round during periods of high or low flow while also maintaining freeboard requirements. Seepage collection ponds along the TMF and polishing pond will return water to their respective Project components. Seepage at the TMF will be directed to the Reclaim Pond, which will be pumped to the ore processing plant as reclaim water. The overburden stockpile seepage collection ponds may discharge to the environment, if water quality meets discharge criteria.

TMF Pond and Reclaim Pond

The TMF pond will be formed by the deposition of tailings slurry within the TMF, as supernatant water will accumulate in the topographical low towards the east end of the TMF. The minimum capacity of the TMF pond at each stage of deposition over the Project life will be maintained at 200,000 m^3, and will allow for settling of tailings solids, prior to water being directed to the Reclaim Pond.

The TMF pond and the Reclaim Pond will have emergency overflow spillways to discharge volumes exceeding design capacity to Bagsverd Lake. The TMF pond and the Reclaim Pond are designed such that the Environmental Design Flood (EDF) will be retained within the two structures without discharge to the environment.

Polishing Pond

The polishing pond, between the ore stockpile and Three Duck Lake (Upper), will allow for improved effluent water quality through the process of natural degradation, whereby any remaining residual chemicals in the water column are passively precipitated, oxidized, taken up through biological processes, and / or volatilized to the atmosphere.

The polishing pond will receive pumped inflows from the mine water pond, MRA seepage collection ponds, as well as runoff from the surrounding area. The polishing pond dams will be constructed as low-permeability water retaining structures. The polishing pond will be operated lower than Three Duck Lake (Upper), such that that the pressure gradient will be from Three Duck Lake (Upper) towards the Polishing Pond, thus avoiding the potential for seepage into Three Duck Lake (Upper). The Polishing Pond will be designed with enough capacity to retain the EDF.

Excess water will be discharged to the environment via the polishing pond to the Three Duck Lake (Upper) discharge location (see Figure 1-2), in compliance with applicable effluent quality criteria. In addition, the polishing pond will have an emergency overflow spillway that will discharge volumes exceeding its design capacity to Three Duck Lakes (Upper).

3.10.7 Watercourse Realignments

As part of the proposed development of the Project, several water features will be fully or partially overprinted and flows redirected using dams and watercourse realignments. The two proposed watercourse realignments will total approximately 2.4 km.

These water bodies include: a portion of the Mollie River, Côté Lake, portions of Clam Lake and Three Duck Lake (Upper), Clam Creek, and approximately 15 small unnamed streams and ponds located throughout or adjacent to the Project footprint (Figure 1-2.)

To accommodate development of the open pit, the Mollie River will be dammed prior to flowing into Côté Lake, to form New Lake, which will flow to the east (through a realigned channel) to Three Duck Lake (Upper). Clam Lake will also be dammed from flowing into Clam Creek or the open pit, which will redirect flow south through a realigned channel into Chester Lake. Water will flow from Chester Lake to New Lake and into Three Duck Lake (Upper) to continue in the Mollie River watershed. During the Closure Phase, and Post-closure stage I, dams and the two realignment channels will remain in place. Drainage patterns will be restored during Post-closure stage II (see Section 3.16).

Watercourse overprinting and realignments have the potential to affect fish habitat and fish communities within the Mollie River watershed and the Mesomikenda Watershed. IAMGOLD will develop habitat compensation plans in support of:

- A *Fisheries Act* Authorization for the water bodies affected by the development of the open pit and other Project components; and
- an amendment to Schedule 2 of the Metal Mining Effluent Regulation (MMER) for the water bodies to be overprinted by mined materials (e.g., the TMF).

Design concepts for the compensation plans have been developed. The objective of habitat compensation measures associated with the Project will be to create habitat which achieves the biotic (e.g., food) and abiotic (e.g., flow, depth, fish passage, cover, and substrate) habitat requirements of the predominant resident fish species (yellow perch, northern pike, walleye and whitefish) and minimizes the risk of adverse effects to the environment (i.e., flooding and erosion). The goal will be to compensate the pre-construction productive capacity and lost habitat on a “like for like” basis to maintain the fish communities within, and the functionality of, the existing habitat. Therefore, the general approach will be to design habitat to meet the current life history requirements of the resident fish. Consideration with respect to spawning, juvenile rearing, adult foraging and overwintering habitat will be incorporated into the compensation design as appropriate. Key design considerations will include:

- Maintenance of existing watersheds to the extent possible;
- maintenance of the existing hydrologic flow regime to the extent possible;
- minimization of temporal disruptions to the extent possible;
- promotion of connectivity within watersheds and habitats;
- use of natural channel design techniques;
- incorporation of opportunities to increase productivity of the system;
- enhancement of habitat complexity; and
- incorporation of any limiting habitat types for resident fish populations to the extent possible.

Developing the preliminary realignment designs and fisheries compensation plan concepts for the Project involves a review of alternatives, detailed evaluation of habitat, integration of watercourse realignment design and fisheries habitat compensation, development of Project phasing, contingency planning, and assessment of monitoring needs. Natural channel design techniques are being applied to mimic natural flow and flooding patterns and incorporate shoreline and riparian vegetation. In addition, features may be incorporated for habitat and physical diversity, and to provide refuge areas (i.e., usable area for fisheries under either low flow or winter conditions).

It is expected that the compensation plans will provide sufficient habitat to maintain the existing fisheries during all phases of the Project. IAMGOLD will seek further opportunities if additional compensation is required. Compensation plans will be in consideration of regional fisheries management objectives and in consultation with the MNRF and Fisheries and Oceans Canada (DFO).

The following sections describe the key realignments in further detail.

3.10.7.1 Côté Lake

A portion of the open pit overprints Côté Lake which requires that it be drained before pre-stripping activities advance. Some pre-stripping of materials will occur early in the Construction phase on high ground within the open pit where dewatering is not required. Drainage of Côté Lake will require the construction of multiple dams to isolate it from connected water bodies. Three dams will be constructed between Clam Lake and the open pit. One dam south of open pit will isolate flows from the Mollie River to the open pit. Two dams at the west end of Three Duck Lake (Upper), which will also be used to establish the Polishing Pond. Dewatering of Côté Lake will occur following the completion of these dams.

The Côté Lake water will be retained to assist with building up the site water inventory in advance of the Operations phase or will be drained to an appropriate receiver in the Mollie River system, which will be determined in consultation with appropriate authorities, local communities, Indigenous groups and stakeholders. Fish in Côté Lake will be caught and released to an appropriate receiver in the Mollie River system as practicable prior to lake dewatering. Any remaining fish will be caught and released continuously during the draining process.

3.10.7.2 Clam Lake and Chester Lake

Three retention dams are required to keep Clam Lake at a safe setback distance from the open pit and to prevent flow into Clam Creek, the lake's natural outlet that currently flows into the footprint of the open pit. Flow will be routed south into Chester Lake via a new realignment channel. This will effectively drain Clam Creek and the portion of the Mollie River located within the extent of the open pit. The realignment channel between Clam Lake and Chester Lake will be approximately 900 m in length, will pass through similar terrain to that of the existing watercourses, and is expected to provide like-for-like fish habitat replacement. It will be constructed and stabilized to provide continual safe passage of fish and suitable flow capacity.

A dam north of Little Clam Lake may be required to prevent intermittent discharge to the north, near the processing plant and TMF.

3.10.7.3 New Lake to Three Duck Lake (Upper)

Water from Chester Lake will flow into New Lake, located between the open pit and the MRA. From there, a realignment channel approximately 1.5 km in length will be established to Three

Duck Lake (Upper). The realignment is expected to provide like-for-like fish habitat replacement. It will be constructed and stabilized to provide continual safe passage of fish and suitable flow capacity.

3.11 Other Facilities and Infrastructure

Other facilities and related infrastructure will be built to support the Project mining activities. These are outlined for on-site and off-site facilities and infrastructure.

3.11.1 On-Site Facilities

The following buildings and yard areas are currently planned for the Project:

- Primary crusher, screen, secondary crusher and run-of-mine stockpile, with associated conveying system;
- ore processing plant;
- maintenance garage, warehouse and administration complex;
- accommodations complex, to be used for both Construction and Operations phases;
- fuel and lube bay;
- general laydown areas and temporary storage facilities during construction; and
- explosives manufacturing (emulsion plant) and storage facilities.

These facilities will be supported by related transport, piping and power infrastructure as needed. Engineering designs are ongoing and the final location of buildings and related infrastructure may be modified to meet the needs of the Project, within the Project property boundaries, unless otherwise planned and / or negotiated.

As shown in Figure 1-2, the location of the ore processing, maintenance and administrative complexes are proposed in one centralized area northwest of the open pit, positioned far enough away from the open pit perimeter to protect workers and facilities from any potential blast (fly) rock. The overall layout has been developed to accommodate efficient operating conditions with the least travel distances between the facilities, particularly with respect to ore and mine rock haulage and tailings pumping. Special attention will be given to the separation of large haul truck traffic and other site (or local) vehicular traffic during the Construction and Operations phases.

The ore processing plant building will house the milling, gravity separation, CIP, reagent, carbon stripping, electrowinning and refining areas, as well as the tailings pumps and compressors. The tailings thickeners, leach tanks, lime slaking and cyanide destruction areas are anticipated to be located outside of the ore processing plant. Adequate equipment and handling procedures will

allow for safe storage and use of cyanide and other reagents, as is standard for Ontario gold mines.

The maintenance garage, warehouse and administration complex will be positioned near to the ore processing plant. It is expected that some temporary general laydown areas will be required during the Construction phase, particularly near the ore processing plant site. Materials and equipment will be kept in the general laydown areas near the ore processing plant site to minimize transport distances to expedite construction efforts. It is possible that some material for tailings dam construction will need to be stockpiled for short periods of time. It is planned to place these small and temporary stockpiles within the future TMF footprint, so as to avoid additional vegetation clearing.

Working bays will allow indoor maintenance on heavy equipment and smaller vehicles. Wash bay(s) will be present for trucks and other equipment to be washed and to allow for effective maintenance and to extend equipment life. Truck wash water will be treated, if required, prior to discharge to the environment to meet regulatory requirements. The chemicals being stored and details on their storage, handling and transportation are presented in Section 3.13.

It is expected that approximately 1,000 to 1,200 workers may be accommodated during the Construction phase. Construction accommodation for this workforce will be developed on-site, and will include sleeping quarters, as well as a dining room, kitchen, recreation facilities and utility rooms. It is currently foreseen that the accommodation complex will be located about 1 km east of the ore processing plant to allow for easy transfer of staff from the accommodation complex to the construction areas. For the Operations phase, the accommodation complex will be converted to hold a workforce of approximately 500 full-time personnel. The location may vary slightly as engineering progresses on the Project.

Explosives needed for the Project will be prepared in a dedicated explosive manufacturing facility or emulsion plant. It is currently foreseen that this facility will be tentatively located towards the east area of the property, at a safe distance from the open pit and mine infrastructure. The distances between the various buildings that make up the facility (ammonium nitrate storage, emulsion plant, explosives magazines) and other facilities and roads will be established in accordance with the Quantity Distance Principles User's Manual (Natural Resources Canada, 1995). It is not expected that explosives can be reasonably transported to the Côté Gold Project site from an off-site facility; however, that alternative will be retained should such a commercial operation be developed locally.

3.11.2 Off-Site Facilities

Non-hazardous solid waste management alternatives were assessed and the analysis is presented in the EA. IAMGOLD intends to deposit non-hazardous waste in a nearby off-site landfill currently operated by the MNRF. The existing MNRF Neville Township Landfill, approximately 2 km from the Project site, will continue to be owned by MNRF and its use to

dispose of Project wastes will be managed through contractual agreements. The agreement delegates MNRF's management responsibilities for the landfill to IAMGOLD in return for MNRF completing the required studies for the expansion of the facility. This agreement will also accommodate local residences around Mesomikenda Lake to continue to use the MNRF Neville Township Landfill. Closure of the landfill would be under the care and maintenance of MNRF. MNRF has been conducting a capacity study on the existing landfill to see if it will meet Project requirements and the future requirements of the existing local residences, and the permitting process is underway. As a contingency measure, if it is determined that the landfill will not be suitable for the Project, then an on-site landfill will be developed. A Waste Management Plan will also be developed in order to minimize waste by initiating a recycling program.

No other Project facilities are proposed off-site, with the possible exception of offices and storage space leased in nearby cities or towns to support hiring or other administrative activities. IAMGOLD currently has offices in Toronto.

The transmission line is considered an off-site component of the Project and is discussed in the following section.

3.12 Transmission Line and Power Supply

Power for initial construction and site preparation will be provided by the existing connection to the Provincial electrical grid. In the event the existing electrical connection to the grid cannot satisfy power demand during the Construction phase, isolated site loads would be supplied by a separate diesel power generation system (<5 MW). During the Operations phase, this system would also be used during scheduled and non-scheduled outages, and to lower the Project energy demands during periods of peak consumption as needed.

Power during the Project Operations phase will be supplied by a 115 kV transmission line connected to the existing Hydro One Network at the Timmins Transformer Station (TS) (see Figure 3-2). The Project requires the abandoned T2R 115 kV circuit between Timmins TS and Shining Tree Distribution Station (DS) to be refurbished and a new 115 kV transmission line from the tap just outside of Shining Tree DS to the mine. The alignment from Shining Tree to the Project site already exists, although re-clearing in the ROW may be required.

The refurbishment of the Hydro One T2R circuit between Timmins and Shining Tree will consist of:

- Replacement of 3 woodpole H-frames;
- replacement of the line conductors from 336.4 kCMIL to 477 kCMIL ACSR;
- replacement of T2R circuit insulators and conductor hardware;
- installation of a new 115 kV breaker with associated switchgear equipment at the Hydro One Timmins TS; and

- installation of a new switch connecting the P13T and P15T busses at the Timmins TS.

The proposed transmission line from the tap near Shining Tree DS to the Project will be 44 km in length on an existing ROW and mainly composed of single wood portal frame structures. However, at some locations steel towers will be used for line or river crossings. The wood frame structures will be H-frame portals with pole heights ranging from approximately 21 to 24 m. Dead-end structures will be guyed. Depending on soil conditions, rock excavation may be required to set poles to the required depth for stability. The steel towers will be rigid lattices with triangular phasing configuration. The structures will require either an overburden or rock foundation depending on existing landscape conditions.

The transmission line will use the following conductor and ground cables:

- Single circuit, three-phase conductor, 26/7 Aluminum Conductor Steel-reinforced, 795 636 MCM (“DrakeGrosbeak”);
- optical ground wire, 24 fibres, 14 mm nominal diameter;
- overhead ground steel shield wire, Alumoweld 9.835 mm diameter; and
- counterpoise wire American Wire Gauge #4.

Electrical clearance for conductors will be in conjunction with C22.3 Nº1 of the Canadian Standards Association. Detailed clearance will be confirmed as engineering designs progress.

3.13 Fuel and Chemical Management

The chemicals to be used and stored at the Project site are: process-related chemicals and reagents, fuels (diesel, propane gas and gasoline), and equipment maintenance materials (oil, grease, lubricants and coolants). Table 3-2 provides an overview of the expected storage requirements for the reagents at the Project site. All chemicals will be transported, stored and handled in accordance with applicable regulations and good management practice. Tanks will be installed with appropriate secondary containment, and protected against potential vehicular collisions if appropriate. Incompatible materials will be stored separately and not in close proximity to the warehouse or other areas.

Most of the fuel required at the Project site will be diesel which is needed to operate the heavy equipment fleet. A fuel station will be established adjacent to the truck shop, for easy access by heavy equipment such as haul trucks. The fuel station will have a diesel fuel pump station for mining vehicles and a containerized lube top-off system for oil, grease, windshield washing fluid and coolants. Fuel will be stored in 15 diesel tanks of 50,000 L each, for a total storage of 750,000 L of diesel at the Project site. Fuel tanks will be double-walled and secondary catchment will be provided. Other vehicle maintenance liquids will be stored in double-walled tanks or equivalent.

A small quantity of gasoline will also be stored in a double-walled Enviro tank at the Project site for use by light vehicles, all-terrain vehicles, snowmobiles, boats and gas-powered tools. Alternatively, for gasoline storage, a dual compartment diesel and gasoline tank could be used, rather than a dedicated gasoline tank. Propane, which would also be stored in a double-walled Enviro tank, may be required at the Project site for use in equipment and potentially for heating. Any storage of pressurized gases will be in accordance with applicable regulations.

All liquid fuel transfer areas, where there is a reasonable potential for spills, will be constructed to contain fuel that might inadvertently be spilled. Automatic shut-off valves and other such equipment as dictated by good industry practice will be installed to further reduce the risk of spills during fuel transfer operations. Oil/water separators will be installed in such locations to manage runoff.

Equipment maintenance materials, such as engine oil, hydraulic oil, transmission fluid, gear oils and greases, will be stored in secured containers within the maintenance shop or warehouse. Lubricants will also be securely stored for use at the ore processing plant.

Various solvents, other cleaners and antifreeze will be required for equipment and vehicle maintenance. These materials will be stored in secured containers within the maintenance garage and protected area of the warehouses. Solvents and cleaners will also be securely stored for use at the ore processing plant.

Table 3-2: Anticipated Reagent Use and Handling

Reagent	Use	Delivery (anticipated)	Storage / Handling
Lime (CaO)	pH adjustment; mix into a hydrated lime slurry in the ore processing plant	Fine powder in contained trucks	Stored in a silo; handled in accordance with industry standards for the protection of worker safety and the environment.
Oxygen (O_2)	Required in leach circuit	Bulk liquid in tanker trucks; expected to be replaced by onsite oxygen plant	Stored in a pressurized holding vessel; handled in accordance with industry standards for the protection of worker safety and the environment.
Sulphur dioxide (SO_2)	Cyanide destruction circuit	Liquid in 26 t tanker trucks; or solid (sodium metabisulphite)	Stored in a pressurized holding vessel and handled in accordance with industry standards for the protection of worker safety and the environment; or bulk bags stored with secondary containment and handled in accordance with industry standards for the protection of worker safety and the environment.

Reagent	Use	Delivery (anticipated)	Storage / Handling
Sodium cyanide (NaCN)	Dissolution of gold; mixed with water and caustic soda to form a leach solution (NaCN)	Solid (briquettes) in containers carried by licensed carriers (preferred); or liquid in tanker trucks, if solid briquettes are not available.	Stored in containers inside a warehouse and handled in accordance with industry standards for the protection of worker safety and the environment; or diluted in a tank, stored in holding tank(s) and handled in accordance with industry standards for the protection of worker safety and the environment.
Caustic soda (NaOH)	For cyanide mixing, carbon neutralization / stripping and electrowinning; diluted prior to use	Liquid in tanker trucks	Diluted in a tank and stored in holding tank(s); handled in accordance with industry standards for the protection of worker safety and the environment.
Flocculant(s)	Slurry thickening (various); mixed into solution as appropriate	Solid, bulk super bags	Bulk bags stored with secondary containment outdoors; handled in accordance with industry standards for the protection of worker safety and the environment.
Copper sulphate ($CuSO_4$)	Catalyst to aid in the cyanide destruction process; mixed with fresh water into solution	Solid, bulk super bags	Bulk bags stored with secondary containment; handled in accordance with industry standards for the protection of worker safety and the environment.
Nitric acid (HNO_3) (or similar)	Acid washing of loaded carbon; diluted prior to use	Liquid in tanker trucks	Stored in a holding tank; handled in accordance with industry standards for the protection of worker safety and the environment.
Activated carbon	Adsorption of gold in solution	Solid, bulk super bags	Bulk bags stored outdoors; inert material handled for dust control.

Other minor reagents may include antiscalants, Leachaid and standard industry fluxes, typically consisting of borax, silica and nitre for use in the induction furnace.
Source: IAMGOLD (2013).

3.14 Domestic and Industrial Waste Management

Domestic wastes produced at the Project site are likely to include: food scraps, refuse, clothing, metal tins, scrap metal, glass, plastic, wood and paper. IAMGOLD has started a recycling program and will expand and accommodate waste management for the Project.

Non-hazardous wastes produced during the Project Operations phase, and possibly also during Project construction, will be landfilled on site or trucked off site to an existing landfill operated by the MNRF (as per Section 3.11.2).

An estimated total of 41,680 m^3 of waste is expected to be produced throughout the life of the Project – approximately 31,680 m^3 during the Construction and Operations phases, and 10,000 m^3 during Closure. Non-hazardous demolition wastes related to closure of the Project are expected to be stored in a dedicated on-site demolition waste landfill upon closure.

The waste projection estimates assume that no recycling efforts are undertaken, and are therefore considered to be very conservative, as IAMGOLD intends to pursue recycling efforts, which will result in waste diversion.

Waste oil and lubricants will be stored in double-walled or equivalent tanks or sealed containers in bermed areas, and periodically removed for off-site disposal at licensed facilities using licensed haulers. Spent solvents, cleaners and antifreeze will also be stored with appropriate secondary containment and periodically removed for off-site disposal at a licensed facility using licensed haulers.

If required, a bioremediation area could be developed for bioremediation of hydrocarbon contaminated soils rather than transporting these materials off-site. This need will be assessed during future engineering investigations.

3.14.1 Domestic Sewage

Domestic sewage treatment alternatives were assessed in the EA. Domestic sewage during the Construction and Operations phases will be treated by an appropriately-sized sewage treatment plant (e.g., sequencing bioreactor, rotating biological contactor, membrane bioreactor, or equivalent), depending on the location and the volume of sewage requiring treatment. Effluent meeting regulatory requirements will be discharged directly to the environment. The location(s) of the facility(ies) has not yet been defined, but generally will be located in proximity to the primary domestic sewage source(s). The remaining sludge will either be trucked off site to a licensed landfill or potentially be disposed of in the TMF.

3.14.2 Solid Wastes

Solid mineral wastes expected to be produced by the Project include overburden, mine rock and tailings. Overburden and mine rock will be re-used where practical and reasonable for construction purposes or otherwise stored in stockpiles. Overburden is expected to be utilized during closure. Further detail is provided in Section 3.5.2. Tailings management is discussed in Section 3.7.

Solid wastes requiring special management at the site are expected to include: waste petroleum products and packaging, waste glycol, petroleum contaminated soil, waste explosives and possibly biomedical waste. All special management wastes will be stored in sealed containers in lined, bermed areas (or by other means of secondary containment as appropriate).

Off-specification petroleum products (and potentially waste oil) may be used as fuel for the diesel generator(s), heat generation, or transported off site. The quantities of used lubricating oils and other lubricants created on site will be minimized to the extent practical. Used glycol, lubricants and associated materials will be stored in tanks with secondary containment and shipped off site by a licensed disposal company. Opportunities to recycle some of the hazardous waste, such as used oil, will be investigated.

Small quantities of other used fluids, such as cleaning solvents and degreasing agents, will be classified by type and either treated on site, if appropriate, or stored and transported off-site to licensed processing facilities in accordance with applicable regulations and good industry practices.

Although every reasonable effort will be made to reduce the potential for spills to the environment, it is recognized that minor spills associated with heavy equipment usage (predominantly petroleum hydrocarbons and glycol) may occur occasionally. Contaminated overburden and other materials, associated with any such spills, will be excavated and treated in an on-site remediation area, or transported off site to a licensed facility for disposal, as appropriate.

Explosive wastes will be destroyed according to an approved methodology by the explosives contractor or licensed personnel.

Only very small quantities of biomedical waste, associated with first aid, are likely to be created on-site. Biomedical waste and other medical items, such as sharps and used needles, will be transported off-site to a licensed facility for proper disposal.

3.15 Project Phases and Schedule

IAMGOLD is making every effort to streamline the Project economic feasibility and engineering studies, and obtain the necessary environmental approvals, to commence some components of Project pre-construction during the winter of 2018 / 2019. Meeting this schedule would allow for gold production at the Project to start in the first quarter of 2021. IAMGOLD understands, however, that several studies are still underway and there is uncertainty in timing of receipt of environmental approvals. Consequently, the timing of some scheduled activities may be constrained.

Ownership, control or access to lands and any infrastructure required to develop the Project will be timed to support construction efforts. Unless stated otherwise above, IAMGOLD will have ownership and control of all Project components and infrastructure and will be responsible for monitoring and maintaining their integrity.

The approximate durations of the key Project phases are as follows:

- Construction: 2 years;
- Operations: 17 years;
- Closure: 2 years; and
- Post-closure:
  - Stage I – 25 to 30 years
  - Stage II

Further details will be determined as the engineering studies progress during the permitting stage.

3.15.1 Construction Phase

Construction activities will be coordinated according to labour force and equipment availability, scheduling constraints and site conditions. Some activities, particularly those involving work in wet or poorly accessible terrains, are best carried out under frozen ground conditions. The development of activities will also consider environmental aspects, such as fish spawning and bird nesting seasons.

The primary Construction phase activities will include:

- Procurement of material and equipment;
- movement of construction materials to identified laydown areas and site;
- expansion of existing environmental protection and monitoring plan(s) for construction activities;
- construction of additional site access roads;
- construction of dams and water realignment channels / ditches for the development of the open pit, as well as the construction of the TMF;
- construction/placement of “compensatory” fish habitat within channel realignment works authorized to offset the loss of fish habitat;
- fish relocation and dewatering of Côté Lake to allow for the pre-stripping of the open pit;
- stripping of overburden and initiation of open pit mine development;
- development of aggregate source(s) anticipated to be principally for concrete manufacture, foundation work and TMF dam filter zones;
- establishment of site area drainage works, including pipelines from fresh water / recycled water sources;

- development and installation of construction facilities including laydown, accommodations complex, augmenting electrical substation capacity and other related construction infrastructure;
- construction of associated buildings and facilities, fuel bay, sewage plant and landfill (if developed);
- preparation of on-site mineral waste handling facilities, including the TMF dams; and
- construction and energizing of a transmission line including on-site electrical substation.

The accommodation complex will be built at the onset of the Construction phase, with a capacity to host 1,000 to 1,200 workers.

3.15.2 Operations Phase

During the Project Operations phase, overburden, mine rock and ore will be extracted from the pit for stockpiling. Ore will also be transported directly to the primary crusher for sizing. Sized ore will be processed in the ore processing plant, where the gold will be recovered and doré bars produced. These products will be transported by road off site by secure means. Typically, for a project of comparable size, the final product is shipped by truck once per week.

As Project operations continue, the open pit will become progressively deeper, and the associated mine rock area and the TMF will become larger and higher.

Solid and liquid wastes / effluent will be managed to comply with regulations. Environment-related activities that will be carried out during the Operations phase are anticipated to include:

- Ongoing management of chemicals and wastes;
- water management / treatment;
- air quality and noise management;
- environmental monitoring and reporting;
- follow up environmental studies; and
- progressive site reclamation, where practical.

3.15.3 Decommissioning / Closure Phase

Rehabilitation of the Project site is expected to take approximately two years to substantially complete, and will commence once operations have ceased. The Project site will continue to be cared for and maintained while the open pit floods. Monitoring activities will be carried out during this period.

Conventional methods of closure are expected to be employed at the Project site. Following closure, and to meet regulatory requirements, some components will be progressively closed out and reclaimed during the post-closure stages. The conceptual closure plan is briefly described in the Section 3.16.

3.16 Conceptual Closure and Reclamation Plan

Closure of the Project site will be governed by the Ontario *Mining Act* and its associated Regulation and Code. The *Mining Act* requires that a Closure Plan be filed for any mining project before it is undertaken, and that financial assurance be provided in advance of Project development to ensure that funds are in place to carry out the Closure Plan.

3.16.1 Components to be Closed

A conceptual layout of the Project site at the end of operations is provided in Figure 3-3. The Project components and associated infrastructure that will require closure include:

- Open pit (including realignment dams) and associated dewatering infrastructure;
- MRA and associated ditching, seepage collection ponds, and piping / pumping equipment;
- overburden stockpile and associated ditching, seepage collection ponds, and piping / pumping equipment;
- low-grade and medium-grade ore stockpile areas and associated seepage collection ponds;
- TMF, Reclaim Pond and associated seepage collection ponds;
- aggregate pits;
- ore processing plant buildings and infrastructure (including machinery);
- accommodation complex and related facilities;
- petroleum products, chemicals and explosives;
- on-site roads, pipelines and power lines;
- general site drainage and water management structures;
- watercourse realignments and retention dams; and
- waste management facilities.

The Project will be closed and rehabilitated in three stages: Closure, Post-closure stage I, and Post-closure stage II. In accordance with the *Mining Act*, Regulation and Code, the first closure stage will encompass the three phases of active closure: Temporary Suspension; the state of Inactivity; and Closure (with respect to site rehabilitation and infrastructure removal that would be undertaken within approximately 2 years of shutdown of operations). Post-closure stage I

covers the period during which the open pit is rehabilitating (flooding), while stage II signifies the time period when the pit has flooded and most of the natural watercourse drainage patterns can be re-established. The conceptual plans for these three stages are briefly described in the following sections.

3.16.2 Progressive Rehabilitation

When practical, areas that are no longer required for Project use may be rehabilitated during the Operations phase. Progressive rehabilitation comprises the activities that contribute to the overall rehabilitation efforts that would otherwise be carried out at closure, and efforts carried out in support of the closure activities (e.g., field trials).

Investigations may be carried out to determine if any enhancement to facilitate revegetation (e.g., fertilization) is required, and to evaluate the possibility of establishing specific wildlife habitats following closure.

Progressive rehabilitation works will include:

- Removal of construction-related buildings and rehabilitation of laydown areas and access;
- removal of roads used during construction;
- stabilization and revegetation of MRA after deposition is completed; and
- stabilization and revegetation of the TMF beaches after deposition is complete.

3.16.3 Closure Phase

The primary objective of the Closure phase is to rehabilitate the Project site area to as near a productive and natural state as practical. All infrastructure will be removed (unless otherwise stipulated, based on agreements with the respective authorities and local communities) and the area able to support plant, wildlife and fish communities or will be considered for other land uses as applicable.

Revegetation will be a key aspect of the rehabilitation measures during this phase. This will occur through seeding and planting of seedlings of indigenous plant species, as appropriate, to initiate colonization of those plant species.

3.16.3.1 Open Pit

It is planned that the open pit will begin filling once dewatering activities cease. Flooding will be achieved passively through receipt of groundwater and precipitation and, potentially, by actively filling the open pit using runoff pumped from the MRA and / or alternate sources (i.e., seasonal fresh water inputs from the nearby watercourses or water from the TMF).

Other measures to be taken to reclaim the open pit may, or are likely, to include:

- Construction of a boulder fence around the perimeter of the open pit and a barricade at the pit access ramp(s) during or following active mining operations to maintain safety while the pit is flooding;
- construction of a permanent overflow spillway to safely convey runoff from all flood events, including the inflow design flood, which is assumed to be the Probable Maximum Flood (PMF);
- removal of infrastructure and equipment within the open pit and clean-up of any fuels and lubricants such as petroleum hydrocarbons from vehicles and / or mechanical equipment, if necessary; and
- revegetation of the non-flooded overburden slopes within the open pit to help stabilize the slopes and facilitate establishment of riparian habitat along the pit lake margins. Stockpiled topsoil or overburden will be used as a medium for revegetation.

Currently, issues with regards to the chemistry of the flooded open pit water are not anticipated.

3.16.3.2 Mine Rock Area

Current geochemical analyses indicate that mine rock is NAG. The MRA slopes will be designed and constructed to meet closure requirements. The exterior slopes of the MRA will be graded and stabilized, if / where required, to promote long-term stability and drainage, once the maximum height is reached. Flat surfaces of the MRA will be partially covered with a layer of overburden and partially vegetated to expedite the colonization of indigenous plants and trees. Areas which receive a layer of overburden will be designed to prevent pooling of water. It is expected that progressive rehabilitation of the MRA will be carried out during operations, with the final configuration reached to minimize the amount of rehabilitation effort required at the time of closure.

3.16.3.3 Medium and Low-Grade Ore Stockpiles

IAMGOLD proposes to process all stockpiled medium and low-grade ROM ore during the Operations phase. Thus, reclamation of these stockpiles is not expected.

3.16.3.4 Overburden Stockpile

During the Closure phase, material from the overburden stockpile, including topsoil, will be used to provide the medium for revegetation of the rehabilitated site components and areas. Due to the limited quantities of overburden available on-site, this stockpile is expected to be utilized during the Operations and Closure phases. The stockpile area will be graded and vegetated at closure. Should any overburden remain at closure, this material will be graded to promote drainage and vegetated. Once vegetation is established, the dams creating the runoff collection

ponds would be breached and runoff either directed to the open pit to assist with flooding or discharged to the environment.

3.16.3.5 Tailings Management Facility and Reclaim Pond

The closure concept for the TMF has been developed to promote long-term chemical and physical stability, minimize erosion, provide long-term environmental protection, and minimize long-term maintenance requirements. Initial assessment indicates that the tailings will be NAG. Additional test work is underway to confirm the geochemical characteristics of the tailings.

At the end of the Operations phase, assuming the tailings are NAG, the TMF will be drained of supernatant water. During initial closure, TMF runoff will continue to report to the Reclaim Pond. Excess water during this period is expected to be directed to the open pit to enhance flooding. Once Reclaim Pond water quality is suitable for environmental discharge, the Reclaim Pond dam will be breached and TMF / Reclaim Pond area runoff will report to Bagsverd Lake.

The tailings beach will be vegetated with native species. Test plots will be carried out prior to closure to determine optimum seed mixture and fertilizers required to promote sustainable plant growth. Pending results of the test plots, other alternative measures may be taken into consideration to establish successful sustainable vegetation. Perimeter ditches will be left in place and protected from erosion, as needed.

Runoff and seepage from the revegetated / rehabilitated TMF is expected to be suitable for release to the environment. However, it will also be monitored and, if necessary, control and treatment measures will be implemented to adequately protect receiving waters.

3.16.3.6 Polishing Pond

Upon closure, polishing pond water will be pumped to the open pit to assist with pit flooding. The polishing pond area will be contoured and vegetated as appropriate. The area will be allowed to flood naturally, or potentially enhanced by other site runoff of appropriate quality. Upon flooding to the Three Duck Lakes (Upper) water level, the east dam will be breached and the Polishing Pond area will be reconnected to Three Duck Lakes (Upper). The dam on the west side of the polishing pond will be removed once the open pit lake is flooded and drainage patterns are restored.

3.16.3.7 Dewatering Infrastructure

Pumps, pipelines, sumps and associated equipment used for open pit dewatering during the Operations phase will be removed from the pit and sold for re-use / recycle, or disposed of either at the on-site demolition landfill (see Section 3.16.3.9) or at external licensed facilities.

3.16.3.8 Aggregate Pits

There are currently two aggregate pits (designated as Category 9 – Aggregate Pit on Crown Land, “Pit above Water” - under the Aggregate Resources Act) permitted in the vicinity of the Project. If a quarry or additional pits are required and developed during the Construction and / or Operations phases, these, as well as the already existing aggregate sources, will be progressively rehabilitated and reclaimed according to Provincial approvals and standards; this may include natural flooding to create pond features.

3.16.3.9 Removal and Disposal of Buildings and Infrastructure

Development of a dedicated on-site demolition waste landfill is proposed for the disposal of non-hazardous demolition wastes (such as concrete, steel, wall board and other inert materials) generated during closure. It is expected that this demolition landfill will be developed within a portion of the NAG, MRA or within an approved landfill site.

Salvageable machinery, equipment and other materials will be dismantled and taken off site for sale or reuse, if economically feasible. There will be no equipment containing polychlorinated biphenyl (PCB) used at the site. Gearboxes or other equipment, containing hydrocarbons that cannot be cleaned out, will be removed from equipment and machinery and transported off site for disposal at a licensed facility.

Above-grade concrete structures will be broken and reduced to near grade, as required. Concrete structures and affected areas will be in-filled, contoured, and covered with overburden, as needed, and vegetated.

3.16.3.10 Petroleum Products, Chemicals and Explosives

All petroleum products and chemicals will ultimately be removed from the site. Empty tanks will be sold as scrap, re-used off-site, or cleaned to remove any residual fuel or chemicals and deposited within the demolition landfill.

An environmental site assessment will be conducted at the end of operations or early in the Closure phase to delineate areas of potential soil contamination, particularly around fuel handling areas. Soil found to exceed acceptable criteria will be remediated on site or transported off site to an approved disposal facility.

Any remaining explosives will be either detonated on site or hauled off site by an authorized transportation company.

3.16.3.11 Roads, Pipelines and Power Lines

Unless otherwise previously negotiated with the respective authorities, Indigenous groups and local communities, site roads will be scarified, edges sloped as appropriate, and vegetated

when no longer required to support final reclamation, long-term site management and / or environmental monitoring programs. Safety berms, if any, along the perimeter of haul roads will be levelled. Culverts will be removed in accordance with regulatory guidelines and roads will be breached to allow natural drainage.

The Chester EACOM road is expected to remain in place following closure to provide continued access to forest harvest areas identified within the 100-year Forest Management Plan (FMP).

There will be a number of pipelines at the site, including the tailings slurry pipeline and the reclaim water pipeline between the ore processing plant and the TMF. Buried pipelines that are not removed will be plugged and left in place or purged, if needed, dismantled and disposed of in the on-site demolition waste landfill.

The pumps and pipelines used to direct water from the MRA seepage collection ponds to the mine water pond during the Operations phase will be used to direct water from the MRA water seepage collection ponds to the open pit.

The transmission line will continue to operate during the Closure phase to provide power to the pump houses and potential water treatment plants as necessary (see Section 3.16.5 for transmission line decommissioning).

The on-site power lines, poles and associated equipment that have no salvage value will be dismantled and deposited in the on-site demolition landfill. Other power equipment and materials, including oil-filled transformers, will be taken off-site for sale or reuse. Any contamination, should it occur, will be appropriately cleaned up.

3.16.3.12 Watercourse Realignments

Watercourse realignments and associated dams will be left in place during this stage. IAMGOLD will consider the potential for directing a portion flows during high runoff periods (e.g. spring freshet) to the open pit to enhance flooding of the open pit.

3.16.3.13 Site Drainage and Water Structures

The general site drainage patterns will remain in place at closure, except for drainage from culverts and related ditches during site road reclamation activities.

Water intake structures constructed at the Mesomikenda Lake (or other water bodies, if any) will be removed and any mechanical components will be disposed of in the on-site demolition waste landfill.

3.16.3.14 Waste Management

Solid Wastes

An on-site demolition waste landfill will be constructed within a portion of the NAG, MRA or within an approved landfill site exclusively for receiving non-hazardous demolition wastes related to the closure of the Project site. At the end of rehabilitation activities, the on-site demolition waste landfill will be capped and revegetated in a manner consistent with the remainder of the site and environmental approval requirements.

Domestic Sewage

The sewage treatment plant installed at the Project site will be removed and disposed of. Non-hazardous wastes will be sent to the on-site demolition waste landfill, while hazardous wastes will be removed from the site and disposed of in accordance with Provincial approvals and standards.

3.16.4 Post-Closure Stage I

Following the removal of infrastructure and waste, as well as the revegetation of disturbed areas, the open pit will continue to flood. It is anticipated that this stage could last approximately 25 to 30 years. Flooding will occur through natural groundwater infiltration and precipitation, as well as by active filling from the following sources:

- TMF / Reclaim Pond;
- Polishing Pond;
- water collected in some or all of the MRA seepage collection ponds;
- site runoff from areas naturally draining towards the open pit; and
- a portion of the spring freshet from New Lake.

Post-closure stage I is shown in Figure 3-4. Watercourse realignments and associated dams will be left in place during Post-closure stage I. The transmission line will continue to operate during this post-closure stage to provide power to the pump houses. Monitoring of water quality in the Reclaim Pond and MRA seepage collection ponds will be ongoing during open pit filling. Should water quality be determined suitable for release to the environment, IAMGOLD may consider ceasing pumping from these areas to the open pit.

3.16.5 Post-Closure Stage II

Post-closure stage II is the final stage of rehabilitation of the site and commences once the open pit is completely flooded. The main objective is to reincorporate the open pit lake into the existing water systems and to return the sub-watersheds to their pre-mining conditions, as much as practicable. This will be completed as shown in Figure 3-5.

3.16.5.1 Mine Rock Area

Once the open pit is fully flooded or pumping from the MRA seepage collection ponds has ceased, ongoing monitoring data for the ponds will be assessed to determine if water quality is suitable for discharge to the environment. Based on current studies of the mine rock geochemistry, issues with water quality are currently not anticipated.

If the water quality is deemed suitable for discharge to the environment, pumping from the MRA seepage collection ponds to the pit would cease and they will be drained. Any settled solids or sediments would be sampled to identify suitability to remain in place. The pond dams would then be breached and the breached dam slopes stabilized. The area around the seepage water collection ponds would be revegetated and the water would naturally drain to the environment. The infrastructure that facilitated the pumping would be removed and appropriately disposed of and / or recycled / reused where possible, either in the demolition landfill or in an appropriate off-site location.

If the water quality of the MRA seepage collection ponds is not deemed suitable for direct discharge to the environment, pumping of this water into the pit and water quality monitoring would continue, and decommissioning of the transmission line would be carried out at the end of this stage.

3.16.5.2 Reclaim Pond

Once the open pit is fully flooded or pumping from the Reclaim Pond has ceased, ongoing monitoring data for the Reclaim Pond will be assessed to determine if water quality is suitable for discharge to the environment. Based on results of current studies of the tailings geochemistry, issues with water quality are not anticipated.

If the water quality is deemed suitable for discharge to the environment, no further pumping from the Reclaim Pond to the pit would cease and the pond would be drained. Any settled solids or sediments would be sampled to identify suitability to remain in place. The Reclaim Pond dams would then be breached and the breached dam slopes stabilized. The area around the Reclaim Pond would be vegetated and the water would naturally drain to Bagsverd Lake. Pumping infrastructure would be removed and appropriately disposed of and/or recycled/reused where possible, either in the demolition landfill or in an appropriate off-site location.

If the water quality from the Reclaim Pond is not deemed suitable for direct discharge to the environment, pumping of the Reclaim Pond water into the pit and water quality monitoring would continue; and decommissioning of the transmission line would be carried out at the end of this stage.

3.16.5.3 Watercourse Realignments and Site Drainage

The remaining dams will be removed / breached to restore natural flow through the Mollie River subwatershed (see Figure 3-5).

Mollie River Subwatershed

The Post-closure stage II flow of water is shown in Figure 3-5. The dam between the flooded open pit and the former polishing pond area will be removed / breached and flows from the open pit will drain towards Three Duck Lake (Upper). Side slopes of reclaimed water retention dams will be stabilized.

The dams located between Clam Lake and the open pit lake will be removed / breached. The re-alignment channel between Clam Lake and Chester Lake will remain in place and will be contoured and revegetated to promote establishment of wetland habitat.

The dam between New Lake and the open pit lake will be removed or lowered to restore the Mollie River system and will be directed to the open pit with low flows maintained to the re-alignment channel to support fisheries. This will fully integrate the pit lake into the Mollie River subwatershed.

The details regarding maintenance of a portion of New Lake as a grade control structure or weir to divert a portion of the flows to the realignment channel to maintain fish habitat will be re-evaluated prior to closure. This control structure could also enhance flexibility to maintain flows through the Three-Duck Lake system if the pit lake water quality is not as predicted.

3.16.5.4 Open Pit Lake

The open pit lake will be integrated into the Mollie River subwatershed as described above.

3.16.5.5 Transmission Line

The transmission line from the Shining Tree DS to the Project site will continue to operate during the Post-closure phases to provide power to the pump houses and potential water treatment system as required. Once the water quality is suitable for discharge to the environment without treatment, there will no longer be a necessity to keep maintaining the transmission line and it will be dismantled, unless otherwise transferred to another operator as needed to service regional needs. This will be determined in consultation with stakeholders near the end of the Operations phase.

Rehabilitation will involve removal and recycling / reuse of electrical equipment. Poles will be removed or cut at grade, and either reused or appropriately disposed of, either in the demolition landfill or in an appropriate off-site location, unless other use is negotiated with local

communities and/or Indigenous groups. The transmission line component from Timmins to Shining Tree DS is expected to remain under Hydro One Networks' control.

4.0 UPDATED DESCRIPTION OF PROJECT EFFECTS

4.1 Methodology

The same methodology that was applied to the EA was applied to the EER, to assess and compare the predicted residual environmental effects (effects) resulting from Project optimization. This included the following steps:

- Review of effects assessment indicators – effects assessment indicators that formed part of the EA were re-evaluated with the team of experts responsible for each discipline and it was concluded that these were still applicable to the EER. For completeness, the indicators have been presented in Section 4.1.1 and changes have been indicated where applicable.
- Updating of study areas – study areas defined in the EA to describe the geographic extent of potential environmental effects were re-evaluated and updated as needed to reflect the updated Project layout. This is presented in Section 4.1.2.
- Updating the prediction of potential effects – based on the Project design, including mitigation, effects in the EA were re-evaluated through modelling or qualitative analysis. It should be noted that the process of predicting effects and developing mitigation measures is inherently iterative. This is presented in Sections 4.2 to 4.14.
- Updating mitigation measures – updating measures for the elimination, reduction or control of adverse environmental effects. Updates to mitigation measures are presented in Chapter 5.
- Updating the determination of significance – based on the results of the assessment of potential effects and the application of mitigation measures, the significance of the residual effect, or the potential impact, is assessed through predetermined assessment criteria (magnitude, geographic extent, duration, frequency, reversibility and likelihood) and a significance decision tree. Residual adverse effects that are determined to be significant are not acceptable for the Project and when required, further mitigation, monitoring and management measures were incorporated in the Project to reduce the significance level of such potential effects. The updated determination of effects significance is presented in Chapter 6.

4.1.1 Selection of Effects Assessment Indicators

The identification of potential effects is based on an analysis of the interactions of the various Project components with the physical, biological and human environments. Effects assessment indicators are aspects of the physical, biological and human environment that are particularly notable or valued because of their ecological, scientific, resource, socio-economic, cultural, health, aesthetic, or spiritual importance, and which have a potential to be adversely affected by Project development. The identification of effects assessment indicators ensures that the impact assessment is practical, concise and relevant, and indicators are chosen such that they represent the potential effects on the environment.

The effects assessment indicators that were included in the EA were reviewed and considered applicable for the EER. The list of physical, biological and human environment effects indicators is provided in Table 4-1.

Table 4-1: Physical, Biological and Human Environment Effects Indicators

Discipline	Indicator	Difference between EER and EA
Physical Environment		
Air Quality	Suspended Particulate Matter (Dust) as Total Particulate Matter ($PM_{tot.}$)	No change from EA
Air Quality	Suspended Particulate Matter (Dust) as Particulate Matter (PM_{10}); 24 Hour Average	No change from EA
Air Quality	Suspended Particulate Matter (Dust) as Fine Particulate Matter ($PM_{2.5}$); 24 Hour Average	No change from EA
Air Quality	Suspended Particulate Matter (Dust) as Fine Particulate Matter ($PM_{2.5}$); Annual Average	No change from EA
Air Quality	Sulphur Oxides (SO_x), mainly as Sulphur Dioxide (SO_2)	No change from EA
Air Quality	Nitrogen Dioxide (NO_2); 24 Hour average	No change from EA
Air Quality	Nitrogen Dioxide (NO_2); 1 Hour Average	No change from EA
Air Quality	Arsenic; 24 Hour Average	No change from EA
Air Quality	Lead	No change from EA
Air Quality	Manganese; 24 Hour Average	No change from EA
Air Quality	Volatile Organic Compounds (VOCs)	No change from EA
Air Quality	Other Key Metals	No change from EA
Air Quality	Hydrogen Cyanide (HCN); 24 Hour Average	No change from EA
Noise & Vibration	Daytime Noise Level	No change from EA
Noise & Vibration	Nighttime Noise Level	No change from EA
Noise & Vibration	Blasting Noise Level	No change from EA
Noise & Vibration	Blasting Vibration Level	No change from EA
Hydrology	Change in Flow	No change from EA
Water Quality	Change in Water Quality	No change from EA
Hydrogeology	Groundwater Levels (Water Table)	No change from EA

Discipline	Indicator	Difference between EER and EA
Biological Environment		
Terrestrial Biology	Upland Plant Community Types	No change from EA
Terrestrial Biology	Wetlands	No change from EA
Terrestrial Biology	Vegetation Species at Risk, Species of Special Concern and Provincially Rare Species	No change from EA
Terrestrial Biology	Ungulates	No change from EA
Terrestrial Biology	Furbearers	No change from EA
Terrestrial Biology	Migratory Birds	No change from EA
Terrestrial Biology	Wildlife Species at Risk	No change from EA
Terrestrial Biology – Transmission Line (TL)	Vegetation Communities	No change from EA
Terrestrial Biology - TL	Ungulates - Moose	No change from EA
Terrestrial Biology - TL	Furbearers - Wolves	No change from EA
Terrestrial Biology - TL	Furbearers - American Marten	No change from EA
Terrestrial Biology - TL	Furbearers - Black Bear	No change from EA
Terrestrial Biology - TL	Bats	No change from EA
Terrestrial Biology - TL	Migratory Birds	No change from EA
Terrestrial Biology - TL	Raptors	No change from EA
Terrestrial Biology - TL	Species at Risk, Species of Special Concern and Provincially Rare Species	No change from EA
Aquatic Biology	Aquatic Toxicity	No change from EA
Aquatic Biology	Commercial, Recreational and Aboriginal (CRA) Fisheries	No change from EA
Aquatic Biology	Aquatic Habitat	No change from EA
Human Environment		
Land and Resource Use	Land Use Plans and Policies	No change from EA
Land and Resource Use	Mineral Exploration	No change from EA
Land and Resource Use	Forestry	No change from EA
Land and Resource Use	Hunting	No change from EA
Land and Resource Use	Trapping	No change from EA

Discipline	Indicator	Difference between EER and EA
Land and Resource Use	Recreational and Commercial Fishing	No change from EA
Land and Resource Use	Cottages and Outfitters	No change from EA
Land and Resource Use	Navigable Waters	No change from EA
Land and Resource Use	Other Recreational Uses	No change from EA
Traditional Land Use	Plant Harvesting	No change from EA
Traditional Land Use	Traditional Hunting	No change from EA
Traditional Land Use	Fishing	No change from EA
Traditional Land Use	Canoeing	No change from EA
Traditional Land Use	Cultural, Spiritual and Ceremonial Sites	No change from EA
Visual Aesthetics	Change in Landscape from Receptor Locations	No change from EA
Visual Aesthetics	Change in Landscape from Non-Receptor Locations	No change from EA
Visual Aesthetics	Change in Landscape due to the Transmission Line	No change from EA
Socio-Economic	Labour Market	No change from EA
Socio-Economic	Business Opportunities	No change from EA
Socio-Economic	Government Finances	No change from EA
Socio-Economic	Population and Demographics	No change from EA
Socio-Economic	Community Health Conditions	No change from EA
Socio-Economic	Housing and Temporary Accommodation	No change from EA
Socio-Economic	Public Utilities	No change from EA
Socio-Economic	Education	No change from EA
Socio-Economic	Emergency Services	No change from EA
Socio-Economic	Other Community Services	No change from EA
Socio-Economic	Transportation	No change from EA
Archaeology	Effect on Heritage Resources	No change from EA
Cultural Heritage Landscapes and Built Heritage Resources	Effect on Heritage Resources	No change from EA

4.1.2 Selection of Study Areas

The prediction of effects on the environment takes into consideration the geographic extent of the effects. The same three study area types included in the EA have been considered in the EER, and include: the Project footprint, the local study area (LSA) and the regional study area (RSA).

The Project footprint is defined by the direct footprint of onsite Project components. In comparison to the EA, the Project footprint is more compact because of layout optimizations (refer to Figure 3-1 for a comparison). The Project footprint is presented in Figure 1-2.

The LSA and RSA are defined for each discipline and were defined in the EA to describe the geographic extent of potential environmental effects. Study areas were re-evaluated and updated as needed to reflect the updated Project layout, as shown in Table 4-2.

Table 4-2: Local Study Areas and Regional Study Areas for the Updated Effects Assessment

Discipline	LSA Difference between EER and EA	RSA Difference between EER and EA
Air Quality	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout. • GHG organization boundary: no change from EA.	• No change from EA.
Noise & Vibration	• No change from EA	• No change from EA.
Hydrogeology	• No change from EA	• No change from EA.
Hydrology	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout.	• No change from EA.
Water Quality	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout.	• No change from EA.
Terrestrial Biology	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout.	• Methodology for defining RSA boundary: no change from EA. • RSA boundary revised to reflect the updated Project layout.

Discipline	LSA Difference between EER and EA	RSA Difference between EER and EA
Aquatic Biology	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout.	• No change from EA.
Land and Resource Use	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated LSAs for terrestrial and aquatic biology.	• Methodology for defining RSA boundary: no change from EA. • RSA boundary revised to reflect the updated RSAs for terrestrial and aquatic biology.
Traditional Land Use	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated LSAs for terrestrial and aquatic biology.	• Methodology for defining RSA boundary: no change from EA. • RSA boundary revised to reflect the updated RSAs for terrestrial and aquatic biology.
Human and Ecological Health Risk	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated LSAs for air quality and water quality.	• Methodology for defining RSA boundary: no change from EA. • RSA boundaray revised to reflect the updated RSAs for air quality and water quality.
Visual Aesthetics	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout.	• No change from EA.
Socio-Economic	• No change from EA.	• No change from EA.
Archaeology and Built Heritage	• Methodology for defining LSA boundary: no change from EA. • LSA boundary revised to reflect the updated Project layout.	• Methodology for defining RSA boundary: no change from EA. • RSA boundary revised to reflect the updated Project layout.

4.1.3 Prediction of Effects

The environmental effects review was conducted through a detailed review of the effects described in the EA including the Technical Support Documents (TSDs), and comparison to effects predicted for the optimized Project. The key differences have been summarized below, with detailed results for each discipline included in the updated technical memorandums (UTMs) provided in Appendix B.

The prediction of effects presented below has taken into consideration mitigation measures inherent in the Project design as well as additional measures that have been incorporated in the Project design as a deeper understanding of the potential environmental effects was acquired. The mitigation measures for each discipline are presented in Chapter 5.

4.2 Air Quality

The air quality assessment for the Project was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered updated air dispersion modelling and greenhouse gas assessment. The detailed assessment is presented in Appendix B-2.

Key differences between the EA and the Project relevant to air quality are:

- Reductions in key operating parameters, including the mining rate and maximum annual movements of ore, overburden, and mine rock, and the total ore, overburden, and mine rock over the life of the mine;
- a reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF;
- relocation of the TMF nearer to the open pit;
- realignment of the haul road used to transport mine rock from the open pit to the MRA; and
- the use of fewer and smaller haul trucks to transport materials.

A summary of key results is presented in the following subsections.

4.2.1 Updated Effects Assessment – Air Quality

Activities carried out during the Construction phase use similar mining equipment as the Operations phase, and particulate matter (dust) is the major emission. Construction emissions will be managed through a dust best management plan (DBMP). The DBMP will include practices to minimize dust emissions (e.g., watering, travel area surface management) and a complaint response plan. Construction phase effects will be less, and of shorter duration than those predicted for the Operations phase. As a result, the effects prediction considered the sources of air emissions that are associated with the Operations phase of the Project. Air quality effects associated with transmission line construction will be limited to heavy equipment operating during the short-term Construction phase; therefore, no air quality prediction specific to transmission line construction was undertaken.

For the Operations phase, the following emission sources were identified for the Project and included in the dispersion modelling:

- Emissions from blasting;

- material handling in the open pit;
- dust from crushing;
- road dust emissions (re-entrained dust);
- dust from managing mine rock, ore and overburden; and
- exhaust from back-up power generation.

In addition, air emissions from gold processing (for example hydrogen cyanide (HCN) and sulphur dioxide (SO_2) were also modelled. Nitrogen oxide (NOx) emissions occur from the blasting, combustion of propane for process plant heating, and from the testing of back-up generators.

The following changes to the assessment were made to reflect the Project:

- Revised Project boundary;
- relocation of TMF and main haul route; and
- updated emission rates based upon reduced mining and ore processing rates, material movements, TMF footprint, and changes to the open pit.

The modelling indicates the location of effects, which vary with direction and distance as a result of source locations, meteorological conditions and receptor elevation. The model considers the effect of topography on dispersion; therefore, nearby receptors at elevated heights typically have higher concentrations than receptors at the same distance from a source but located at lower elevation.

The prediction of air quality determined that particulate matter levels for TSP, PM_{10}, and $PM_{2.5}$ exceeded Ambient Air Quality Criteria (AAQC) in a small area proximate to the Project site boundary, which is consistent with the findings of the EA, however, the predicted effects have decreased for all particle size fractions, and there were no exceedances of the criteria or standards at the cottages in the vicinity of the Project that were identified as sensitive receptors.

All other air quality assessment indicators were determined to be below the AAQCs and Canadian Ambient Air Quality Standards (CAAQS) in all cases, and the predicted effects for the Project are lower than those of the EA.

Project effects on air quality are, for the most part, expected to be limited to the LSA. There are no other known projects located in proximity to the Project that would result in cumulative effects on air quality.

Activities in the active Closure phase are similar to those that occur during the Construction phase and use similar mining equipment. The DBMP will include practices to minimize dust

emissions during the Closure phase (e.g., watering, travel area surface management) and a response plan. No specific closure phase air quality assessment was completed.

The Post-closure phase is predominantly monitoring with occasional repairs and maintenance. There is no significant equipment use. No air quality effects are expected from these activities. The only emissions during the Post-closure phase would be gases from the potential landfill that would include VOCs. There are no changes to the Project description that would affect the landfill gas emissions; therefore no update to the previous assessment of landfill gas from an air quality perspective was completed.

4.2.2 Updated Effects Assessment – Greenhouse Gas

An update to the Greenhouse Gas (GHG) assessment was completed to reflect the reduction in mine fleet fuel use, purchased electricity, and blasting for the Project. The findings of the GHG assessment are as follows:

- The majority (97%) of Project GHG emissions are the result of mine fleet fuel combustion and purchased electricity;
- the GHG emissions for the Project are expected to be notably less than effects presented in the EA (28% lower over life of Project);
- the GHG emissions from the Project are very minor in comparison to the overall Canadian and Ontario GHG inventories; and
- IAMGOLD will prepare an annual inventory of GHG emissions, and will comply with all relevant GHG reporting and management legislation and with IAMGOLD corporate sustainability programs.

The input data used to estimate the emissions is based on current operating assumptions and forecasts, and may differ from the actual emissions in any given year.

4.2.3 Differences from the EA

The updated air quality assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Results of air dispersion modelling demonstrate that modelled concentrations have decreased at all off-site receptors for all particulate size fractions, all averaging times and the modelled concentrations for the metals that correspond directly with particulate matter. In addition, the GHG emissions for the Project are expected to be notably less than effects presented in the EA.

4.3 Noise and Vibration

The noise and vibration assessment for the Project was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered updated noise and vibration modelling. The detailed assessment is presented in Appendix B-3.

Key differences between the EA and the Project relevant to noise and vibration are:

- Reductions in key operating parameters, including the mining rate and maximum annual movements of ore, overburden, and mine rock, and the total ore, overburden, and mine rock over the life of the mine;
- a reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF;
- relocation of the TMF nearer to the open pit; and
- the use of fewer and smaller haul trucks to transport materials.

A summary of key results is presented in the following subsections.

4.3.1 Updated Effects Assessment

The prediction of noise and vibration effects considers noise and vibration effects to surrounding sensitive receptors, and considers the MOECC's noise and vibration guidelines.

No noise mitigation measures have been considered for the Project. However, equipment noise levels will not exceed those noted in Appendix B-3.

For the Construction phase, it is expected that daytime noise levels at receptor locations will be below baseline ambient noise levels. Nighttime noise levels may exceed baseline ambient noise levels at some receptor locations. However, daytime and nighttime construction noise levels at the modelled receptors are within the MOECC criteria limits. Blasting noise levels are expected to meet applicable MOECC guidelines. Blasting vibration levels are not expected to damage structures or exceed the criteria limit.

For the Operations phase, it is expected that daytime noise levels at receptor locations will be below baseline ambient noise levels. Nighttime noise levels may exceed baseline ambient noise levels at some receptor locations. However, daytime and nighttime operational noise levels at the receptors are expected to be within the MOECC criteria limits. Blasting noise levels are expected to meet applicable MOECC guidelines. Blasting vibration levels are not expected to damage structures or exceed the criteria limit.

Nighttime operation restrictions, as proposed in the EA, are no longer required as the predicted sound levels are within the nighttime criteria limit. The change in site layout and reduced production rate helped to lower noise effects at the receptors. Therefore, purchase of noise sensitive receptors may not be required as the Project noise impact at the receptors are predicted to be within the limits.

During the Closure phase, noise effects are expected to be lower than the effects during the Construction phase. To be conservative, it is assumed that noise effects during Closure are

identical to the Construction phase effects. No activities are planned to occur at nighttime. No vibration effects are anticipated as no blasting activities are planned.

Noise and vibration effects have not been explicitly modelled for the Post-closure phase, as the vast majority of the noise sources will be decommissioned during the Closure phase. To be conservative, it is assumed that daytime noise effects during Post-closure stage I will be less than the Closure phase noise effects. Once pumping ceases, noise levels are expected to revert to current baseline conditions. No activities are planned to occur at nighttime. No vibration effects are anticipated as no blasting activities are planned.

4.3.2 Differences from the EA

The updated noise and vibration assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. In most cases, predicted noise levels and blasting noise and vibration levels at the receptors are less than or equal to the levels reported in the EA. While there were some increases at certain receptors, these were within regulatory limits.

4.4 Hydrogeology

The hydrogeological assessment for the Project was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered updated three-dimensional (3D) groundwater flow modelling. The detailed assessment is presented in Appendix B-4.

Key differences between the EA and the Project relevant to hydrogeology are:

- A reduction in the open pit footprint, from approximately 210 ha to 145 ha;
- a reduction in the MRA footprint, from approximately 400 ha to 300 ha, and associated perimeter seepage collection facilities; and
- a reduction in the TMF footprint, from 840 ha to 478 ha, and using a thickened tailings deposition method as opposed to the original conventional slurry method.

A summary of key results is presented in the following subsections.

4.4.1 Updated Effects Assessment

Changes to groundwater levels for Construction phase activities were predicted using the results of the updated 3D groundwater flow model. Predicted effects are limited to the immediate area of the realignment structures and excavated channels and do not differ from those predicted in the EA. Groundwater levels will also decline in the proposed open pit area as overburden is excavated in preparation for mining. The 3D model for open pit development

incorporated groundwater level changes and resulting effects, consistent with the EA, and remains unchanged.

Changes to groundwater levels for Operations phase activities were also predicted using the results of the updated 3D groundwater flow model. Given that the footprint of the pit has reduced and is within the originally proposed extent for which the 3D model was constructed to predict water level drawdowns, the effects predicted for the EA are anticipated to be similar and likely conservative, for the Project layout. The 3D model also predicted seepage through the dams near the open pit to assess flow reduction in the nearby surface water bodies. As the open pit is deepened over the life of mine, groundwater that previously discharged to nearby lakes will be progressively redirected to the open pit, resulting in decreased inflow to these lakes. In addition, leakage from the bottom of the lakes will also contributes to pit inflows, thus decreasing the net groundwater inflow to the lakes. Given that the updated open pit is smaller than the open pit assessed previously, the estimates completed for the originally proposed open pit are considered conservative and valid.

For the Closure and Post-closure phases, a qualitative analysis was undertaken to predict the Project-related effects on groundwater flow. At Closure, pumping activities in the open pit will be terminated and the water level in the open pit will begin to rise in response to pumping from collection facilities, direct precipitation inputs and groundwater inflow. Groundwater levels will rise over the area affected by the Project. During Post-closure, when the open pit is filled and re-connected to the surface water flow system, groundwater levels will continue to rise and over time will approximate pre-mining conditions.

4.4.2 Differences from the EA

The updated hydrogeological assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Given that the footprint of the open pit has been reduced and is within the originally proposed extent for predictions of water level drawdowns, the estimates effects in the EA are anticipated to be similar and likely conservative.

4.5 Hydrology and Climate

The hydrological assessment for the Project was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered updated GoldSim hydrological modelling. The detailed assessment is presented in Appendix B-5.

Key differences between the EA and the Project relevant to hydrology are:

- Revision to Project layout, including location of the open pit, TMF, MRA, ore and overburden stockpiles, and the ore processing plant;
- revisions to the channel re-alignment strategy including a reduction in the number of watercourse realignments (from seven to two);

- revisions to operational (process and site) water flow rates and directions, including change in discharge location; and
- revisions to closure concepts.

A summary of key results is presented in the following subsections.

4.5.1 Updated Effects Assessment

The assessment determined that in general, the potential changes to surface water flows were influenced by two factors; i) the reconfiguration (addition or removal) of watershed area through the development of realignment channels, realignment dams and / or infrastructure footprints such as the TMF and/or ii) the connection of waterways to realignment channels and treated effluent discharge from the Polishing Pond.

Changes to surface water flow during the Construction phase will be limited to those associated with the development of the watercourse realignments. The construction of these features will facilitate the lowering of water levels in Côté Lake for open pit development. However, these features will be designed to manage expected and severe flow events and as such are not assessed separately from the potential effects that could arise during the Operations phase.

Predicted changes to surface water flows during the Operations phase were estimated with the Project footprint at its maximum extent (i.e., full development). For each climate scenario, the predicted change to average annual surface water flow was typically less than 10% through the Project site watersheds. Estimated decreases in surface water flow of greater than 10% were typically associated with localized change to Project infrastructure footprints (e.g., Little Clam Lake, Bagsverd Lake and Clam Lake). Increases to surface water flow through the Three Duck Lakes system (up to 13%) was primarily due to treated effluent discharge and is not expected to affect the hydrological characteristics of the lake system. Predicted change to annual average surface water flow was less than 5% by the flow outlets of the LSA at Mesomikenda Lake and Dividing Lake.

Changes to surface water flow for the Post-closure stage I phase were predicted to be similar to the Operations phase, a result of the realignment features remaining in place and active management of the MRA collection ponds to flood the open pit. Surface water flow decreases of up to 15% compared to existing conditions were predicted through Three Duck Lakes, a result of the cessation of effluent discharge in the upper basin while the open pit is filling.

For the simulated climate conditions, surface water flow changes in Post-closure stage II were estimated to be 10% or less compared to existing conditions, suggesting a long-term return to the natural flow regime at the Project site. Greater than 10% surface water flow changes are predicted at Clam Lake and Little Clam Lake as a result of watershed area change and seepage at the rehabilitated TMF, and rehabilitation and resulting runoff from the rehabilitated

Overburden Stockpile area. This change in flow is not expected to affect the hydrological characteristics of the lakes.

4.5.2 Differences from the EA

The updated hydrological assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Changes to watershed areas will be partially offset by the construction of realignment channels that are intended to maintain flow paths and flow magnitudes similar to those currently observed. The modelled magnitude of surface water flow change for each of the Project phases was typically less than 10% change from existing flows and limited in spatial extent.

4.6 Water Quality

The water quality assessment for the Project was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered updated GoldSim water quality modelling and new or additional baseline data collected since the submission of the EA. The detailed assessment is presented in Appendix B-6.

Key differences between the EA and the Project relevant to water quality are:

- Revision to Project layout, including location of the open pit, TMF, MRA, ore and overburden stockpiles, discharge location and the ore processing plant;
- revisions to the mine plan, including MRA and ore stockpile volumes; and
- revisions to closure concepts.

A summary of key results is presented in the following subsections.

4.6.1 Updated Effects Assessment

Water quality effects predictions were completed using a modified GoldSim water quality model to estimate the water quality at key site components and potential changes to the water quality of the receiving and downstream environments during Operations, Closure and Post-closure. The approach to the modelled prediction of effects, along with climate scenarios, is consistent with those applied in the EA. The criteria used in the EER for the purposes of evaluating the water quality model results are the same water quality guidelines that were used in the EA.

During the Construction phase, the Project activities will consist of the development of site infrastructure and associated facilities prior to initiation of open pit mining. Project components, such as the MRA or TMF, are therefore not expected to be developed sufficiently to influence site water quality. However, a key water quality consideration related to construction is erosion and transport of suspended solids into the adjacent surface water features due to earthwork and other activities that will disturb soil. The implementation of Best Management Practices (BMPs)

for the control of erosion and sediment during construction are expected to mitigate the potential migration of suspended solids to the adjacent surface water bodies and to limit potential changes of existing concentrations of total suspended solids.

During Operations, Closure and Post-closure stage I, monthly average concentrations of some major ions, metals and cyanide are predicted to be continuously to intermittently greater than baseline concentrations (expressed as the 95th percentile) in some lakes in the Mollie River Watershed and Mesomikenda Lake Watershed. Lakes in the Mollie River Watershed that are predicted to have concentrations greater than the 95th percentile concentrations are Moore Lake, Clam Lake, Little Clam Lake, Chester Lake, New Lake, Three Duck Lakes, Delaney Lake and Dividing Lake. Lakes in the Mesomikenda Lake Watershed that are predicted to have concentrations greater than the 95th percentile concentrations are Bagsverd Lake, Neville Lake, and Mesomikenda Lake (upper basin only). The concentrations of major ions, metals and cyanide are predicted to be below the water quality guidelines.

Concentrations of most analytes meet water quality guidelines, apart from arsenic, which is expected to exceed the interim PWQO in Three Duck Lake (Upper and Middle) in some months during a 1:25-dry year event. Potential effects on aquatic biology and human health related to water quality are described in Appendix B-8 and B-11, respectively.

4.6.2 Differences from the EA

The updated water quality assessment demonstrates that the predicted effects for the Project are similar or reduced compared to the EA. The effluent discharge location has been moved from Neville Lake to Three Duck Lakes (Upper), which provides the benefit of eliminating any potential effects that nutrient loading would have on dissolved oxygen depletion in Mesomikenda Lake. Furthermore, the TMF has been moved into the Mollie River Watershed. Therefore, almost all of the effluent that enters the surface water receiving environment, whether it be through discharge from the polishing pond or via seepage, is contained within the Mollie River Watershed. These changes allow for more focused monitoring and management of effluent, and mitigation measures can be more easily implemented (if determined to be needed) in comparison to the EA.

4.7 Terrestrial Biology

The assessment of potential Project-related effects on terrestrial biology was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered results from supplemental baseline surveys. The detailed assessment is presented in Appendix B-7.

Key differences between the EA and the Project relevant to terrestrial biology are:

- Relocation of the TMF nearer to the open pit;

- establishment of a separate overburden stockpile outside the footprint of the MRA;
- a reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF; and
- reduction in power requirements which removes the need for the cross country 230 kV transmission line from Timmins, with the updated TLA shorter in length and using existing ROWs.

A summary of key results is presented in the following subsections.

4.7.1 Updated Effects Assessment

Previously, two TLA options had been investigated and the EA had presented predictions of effects for the Cross Country TLA. The Project no longer requires a newly constructed dedicated 230 kV transmission line due to the reduced power requirement of the processing plant, and therefore, the Project will tie into the Shining Tree DS, greatly reducing the amount of habitat affected. Additional ground surveys were not considered necessary, however three east-west transects were flown along the existing TLA ROW from the Project site to the Shining Tree DS, and this study area extended 750 m from the centerline on each side of the TLA.

The Project footprint, including both the reduced TMF and the use of an existing transmission line and ROW for the TLA, have decreased the amount of habitat which will be affected from that predicted in the EA. The analysis to predict potential Project effects determined that for both the new TMF placement and the chosen Shining Tree TLA, short-term displacement of wildlife species found within the footprints will occur during the Construction and Closure phases of the Project due to the temporary presence of Project personnel and equipment. However, displaced species and their preferred habitats are common throughout both the LSA and RSA and these species will be able to settle in nearby suitable habitats. Conducting Construction and Closure activities between September 1 and April 14 would avoid sensitive summer breeding seasons for wildlife (April 15 to August 31). Later winter habitat areas for Moose (upland coniferous areas) should also be avoided in January and February when Moose can be nutritionally and energetically stressed.

Some wildlife species will avoid the TMF and TLA footprint during the Operations phase (for instance interior species that avoid anthropogenic settings, open fields or linear corridors) but these species and their preferred habitats are also common throughout both the LSA and RSA, and these species will be able to settle in nearby suitable habitats, and will return to the footprints after natural revegetation during the Post-closure phase.

4.7.2 Differences from the EA

The updated terrestrial biology assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. The Project footprint, including

both the smaller area impacted for the TMF construction and the use of an existing transmission line and ROW for the TLA, have decreased the amount of habitat which will be affected from that predicted in the EA.

4.8 Aquatic Biology

The assessment of potential Project-related effects on aquatic biology was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases. The detailed assessment is presented in Appendix B-8.

Key differences between the EA and the Project relevant to aquatic biology are:

- A reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF and more compact overall layout;
- relocation of the TMF nearer to the open pit, and no longer overprinting Bagsverd Creek;
- revisions to the channel re-alignment strategy including a reduction in the number of watercourse realignments (from seven to two), and maintenance of watershed boundaries;
- revisions to seepage collection ponds at the MRA and overburden stockpile;
- change in discharge location; and
- revisions to closure concepts.

A summary of key results is presented in the following subsections.

4.8.1 Updated Effects Assessment

The potential effects to aquatic toxicology were assessed based on changes to predicted water quality. Predicted concentrations (maximums) were identified as having no effect on aquatic life if concentrations were less than the appropriate benchmark (most recent federal or provincial guideline, or a guideline from another Canadian jurisdiction if no federal or Ontario guideline exists). Toxicity reference values (TRVs) were developed for substances without guidelines (i.e., calcium, manganese, sodium, and strontium) and were used for the assessment of effects. Predicted concentrations that were greater than guidelines were compared to chronic toxicity effect thresholds, as appropriate.

Predicted water quality indicated that fewer substances were elevated above benchmarks relative to the EA, and concentrations of most substances achieve water quality guidelines with the exception of arsenic, which is expected to periodically exceed the water quality guideline during the 1:25-dry year climate condition. However, the maximum predicted monthly average concentration is only marginally over the guidelines (0.0071 mg/L) and does not exceed toxicity

thresholds. Concentrations of calcium, magnesium, sodium and strontium are predicted to exceed background / baseline concentrations but these substances, which do not have water quality guidelines, are not predicted to exceed established TRVs. Total cyanide downstream of the TMF and effluent discharge will also exceed background, but free cyanide which is biologically relevant (toxicity) will not exceed established water quality guidelines for the protection of aquatic life.

Generally, most of the potential effects to commercial, recreational, and aboriginal fisheries were addressed in the EA and with the reduction in the footprint of the mine, several potential effects are reduced. The most significant changes are:

- A 33% reduction in areas flooded for habitat creation which will reduce potential for methyl mercury production, although mitigation measures (removal of vegetation and organic soils) will continue to be implemented; and
- the influence of blasting on fish habitat will be realized in the southeast bay of Clam Lake and the north bay of New Lake. The revised off-setting plan will address the disruption of habitat in these areas.

Fish habitat within the LSA will be affected by the construction of dams and channel realignments required to accommodate the development of the open pit as well as the TMF. However, the amount of habitat loss associated with the Project mine plan is substantially less (20 to 25%) than that included in the EA. Given that the habitats to be affected were all assessed in the EA with the exception of a few small ponds overprinted by the new location of the TMF, impact to aquatic habitat and fisheries resources are expected to be less with the Project mine plan than that presented in the EA.

4.8.2 Differences from the EA

The updated aquatic biology assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Fewer potential effects to the aquatic environment are predicted as a result of the smaller and more compact footprint, reduced loss and disruption of aquatic habitat and maintaining of watershed boundaries. Furthermore, several potential effects to Commercial, Recreational, and Aboriginal fisheries have been reduced, and fewer substances were found to exceed selected toxicity benchmarks compared to the EA. The maximum predicted arsenic concentrations in the EA were higher than current predictions and thus any effects are expected to be less.

4.9 Land and Resource Use

The assessment of potential Project-related effects on land and resource use was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases. The detailed assessment is presented in Appendix B-9.

Key differences between the EA and the Project relevant to land and resource use are:

- A reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF;
- relocation of the TMF nearer to the open pit, and no longer overprinting Bagsverd Creek;
- establishment of a separate overburden stockpile outside the footprint of the MRA;
- revisions to the channel re-alignment strategy including a reduction in the number of watercourse realignments (from seven to two);
- revisions to closure concepts, specifically decommissioning and naturalization of watercourse realignments; and
- reduction in power requirements which removes the need for the cross country 230 kV transmission line from Timmins, with the updated TLA shorter in length and using existing ROWs.

A summary of key results is presented in the following subsections.

4.9.1 Updated Effects Assessment

Effects predictions for land and resource use are anticipated to be the same in Construction and Operations phases. A summary of effects for each land and resource use type considered is presented below.

- Land Use Plans and Policies: The Project continues to overlap small portions of the Ontario's Living Legacy Land Use Strategy Areas but is not expected to create any land use conflicts. The Project is located within the Mattagami Region Source Water Protection Planning zones; however, it is expected that there will be no adverse effects on Timmins drinking water supply. Effects predictions on land use plans and policies are predicted to be less than or equivalent to potential effects predicted in the EA.
- Mineral Exploration: The potential effects to mineral exploration are anticipated to be less than predicted in the EA since IAMGOLD acquired lands, previously unavailable, to the west of the Project site from Sanatana.
- Forestry: The Project continues to overlap several small portions of surrounding Forest Management Units but will not substantially limit forestry resources or the ability to conduct forestry activities. IAMGOLD will work with EACOM, who holds the Sustainable Forest Licence for the Spanish River Forest Management Unit, to maintain access through the Project site. Effects on forestry are predicted to be equivalent to or less than effects predicted in the EA.
- Hunting, Trapping and Fishing: The Project will overlap with a number of hunting, trapline and fishing areas and will result in some displacement of wildlife species from the Project site; however, this displacement is not expected to have long-term effects on resources available for hunting, trapping and fishing activities in the area. Some users

may experience a change in viewshed associated with changes to the TMF and MRA. For safety reasons, Clam Lake and Little Clam Lake will be inaccessible during Construction and Operations.

- Cottagers: The Project will not overprint any cottage properties; however, some cottagers may experience changes in background air quality, noise and vibration levels from traffic. Some cottagers may see a change in the viewshed associated with changes to the TMF and MRA. However, these levels are expected to meet applicable regulations. The Project will not limit the use of the area by existing cottagers. Public access along EACOM's forestry road (Chester Road) will be restricted due to potential interactions with the Project; however, IAMGOLD will provide an alternative access route.
- Outfitters: Outfitters are not typically using the areas that would be overlapped by the Project. Tourism / outfitter lodges located in Gogama may see an increase in accommodations revenue from temporary visitors, workers, and/or contractors from the Project. The Project will not limit the use of the area by existing outfitters.
- Navigable Waters: Changes to the Project have resulted in a positive change to the effects predicted in the EA on the 4M Circle Canoe Route. Only one portage on this route will continue to be affected and IAMGOLD will establish a suitable portage / connection such that the 4M Canoe Route will still be usable. Some users may experience a change in viewshed associated with changes to the TMF and MRA. As a result, the predicted effects to navigable waters are expected to be less than or equivalent to EA effects predictions.
- Other Recreational Uses: Other recreational uses could include the use of motorized and non-motorized recreational vehicles, hiking, mushroom and berry picking, and wood gathering. Such uses will not be permitted on or in close proximity to the Project site. However, there is very limited use of the Project site area for these recreational uses. Other recreational uses will not be affected by the loss of access to the Project area since much of the active recreation areas are not affected by the Project footprint. Some snowmobilers may be affected during the short-term construction of the transmission line. Predicted effects along the transmission line for snowmobilers or other recreational users are expected to last only for the Construction phase. Some users may experience a change in viewshed associated with changes to the TMF and MRA.

At the end of the Closure phase, there will be no residual effects on land use policies and plans, recreational and commercial fishing, cottagers and outfitters, and other recreational uses. During Post-closure, affected areas will continue to re-naturalize and therefore habitat will be re-established. Access restrictions will be removed following close out. As habitat is re-established, effects on forestry, hunting and trapping are expected to cease.

4.9.2 Differences from the EA

The updated land use assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Fewer effects to land and resource uses are predicted as a result of the smaller Project footprint, relocation of the TMF and updated TLA.

4.10 Traditional Land Use

The assessment of potential Project-related effects on traditional land use was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases, and considered traditional knowledge and land use studies (TK / TLUS) from the potentially affected First Nations and the Métis including a study received from the Métis subsequent to submission of the EA. The detailed assessment is presented in Appendix B-10.

Key differences between the EA and the Project relevant to traditional land use are:

- A reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF;
- relocation of the TMF nearer to the open pit, and no longer overprinting Bagsverd Creek;
- change in discharge location;
- revisions to the channel re-alignment strategy including a reduction in the number of watercourse realignments (from seven to two); and
- reduction in power requirements which removes the need for the cross country 230 kV transmission line from Timmins, with the updated TLA shorter in length and using existing ROWs.

A summary of key results is presented in the following subsections.

4.10.1 Updated Effects Assessment

It is expected that some components of the Project will overlap with some traditional blueberry harvesting areas, but it is not expected that this will impede the overall ability to harvest blueberries. In general, this effect will last throughout the Construction and Operations phases. However, during the Operations phase blueberry harvesting along the TLA may be enhanced compared to existing conditions.

The construction of Project components is predicted to overlap with some traditional hunting areas. It is not expected that this will impede the ability to carry out traditional hunting activities in the area. This effect is expected to occur throughout the Construction and Operations phases.

Project construction along the TLA will potentially affect portions of the MNO TK / TLUS large game and upland bird harvesting areas. There is a potential for wildlife within the identified traditional hunting areas to be displaced in close proximity to Project construction activities. Wildlife species will likely find equally suitable habitat adjacent to the Project site during the short-term construction activities.

The Project footprint does not overlap any Sensitive Area lakes identified in the FN TK / TLUS. One non-commercial fish harvesting area near the Project site and the TLA was identified in the MNO TK / TLUS. With the effects management strategies identified above in place, it is not expected that the Project will limit the ability to carry out fishing activities in these areas.

The FN TK/TLUS has identified a portage route (assumed to be a canoe route) that follows the chain of lakes that surround the Project and includes lakes: Chester, Clam, Bagsverd, Weeduck, and Three Duck (Upper, Middle, and Lower). The movement of the TMF will result in Clam Lake being inaccessible for use during the Construction and Operations phases due to potential interaction with mine activities and IAMGOLD's commitment to safety (Zero Harm Framework). The use of the canoe and portage route will be controlled, recognizing that an alternate portage connection will be required due to the lack of access through the Project site. IAMGOLD will develop a notification process related to land access controls and / or activity restrictions in consultation with affected Indigenous groups.

The FN TK / TLUS identified an eagle's nest in the vicinity of the Project. Due to the nest's location and its potential removal and considering the importance of the eagle in traditional Ojibwe culture, it is understood that this nest may be a concern for the community. Clearing of the area where the eagle's nest is currently located will take place outside of the breeding season. Should the eagle return to the area, it is expected that the eagle will either find an equally suitable area to build a new nest or will take over a nearby existing nest. The local population of eagles will not be affected by the loss of the individual nest. With the exception of the eagle's nest, the Project does not overlap with any other known or reported traditional cultural, spiritual or ceremonial sites in the LSA or RSA.

During the Closure phase, most of the Project infrastructure will be removed and during Post-closure the watercourse realignments will be decommissioned and naturalized. The TMF and MRA will be closed out and selected areas will be revegetated. At the end of the Closure phase, there will be no residual effects on plant harvesting, hunting, fishing, canoeing and cultural spiritual and ceremonial sites.

Post-closure, affected areas will continue to re-naturalize and therefore, habitat will be re-established. No effects on plant harvesting, hunting, fishing, canoeing and cultural, spiritual and ceremonial sites are expected.

4.10.2 Differences from the EA

The updated traditional land use assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Fewer effects to traditional land uses are predicted, attributed to the smaller Project footprint, relocation of the TMF and discharge location, and updated TLA.

4.11 Human and Ecological Health Risk

The assessment of potential Project-related human and ecological health risk was updated and compared to the results presented in the EA. The assessment evaluated changes in exposure levels and resulting risk to human and ecological receptors resulting from air emissions and water discharges attributable to Project activities. The detailed assessment is presented in Appendix B-11.

Key differences between the EA and the Project relevant to human and ecological health risk are:

- Reductions in key operating parameters, including the mining rate and maximum annual movements of ore, overburden, and mine rock, and the total ore, overburden, and mine rock over the life of the mine;
- a reduction in the Project footprint from 1,700 ha to 1,050 ha, including the reduction in size of the open pit, MRA and TMF;
- relocation of the TMF nearer to the open pit;
- realignment of the haul road used to transport mine rock from the open pit to the MRA; and
- the use of fewer and smaller haul trucks to transport materials.

A summary of key results is presented in the following subsections.

4.11.1 Updated Human Health Risk Assessment

Results of the updated air quality assessment demonstrate that concentrations of contaminants of concern compared to the EA are predicted to be 9% to 22% lower at the maximum point of impingement and 23% to 41% at the nearest sensitive receptor.

Indirect exposure pathways consider the deposition of airborne contaminants to soil with subsequent uptake by plants and animals. This was assessed in the EA through an evaluation of changes in soil quality that would result from airborne deposition over the course of the Project. Over the 15-year operational phase of the facility, depositional modelling concluded there was no appreciable change to background soil quality resulting from aerial deposition. Consequently, it was concluded that exposure via indirect exposure pathways would not result in unacceptable risk attributable to Project emissions for either ecological receptors, or human

receptors who may harvest traditional foods from the area. As emissions are reduced for the Project, this conclusion is still valid.

Potential health risks associated with discharges to surface water were evaluated in the EA through an examination of changes to water quality in the receiving environment under different flow conditions. For all but one parameter modelled, predicted concentrations in the receiving water (monthly maxima), were below applicable water quality guidelines. The one exception was arsenic, where the predicted maximum monthly average concentrations in Three Duck Lakes under the 1:25 year dry condition (Upper and Middle) was higher than the Provincial Water Quality Objectives. However, the maximum predicted concentrations of arsenic in the receiving water were less than the Ontario Drinking Water Quality Standard for arsenic, connoting no unacceptable risk to human health attributable to the Project via this exposure pathway.

In terms of the consumption of fish, predicted changes in water quality when compared to health-based benchmarks was not found to result in unacceptable health risks to users or consumers of such surface water. However, on the understanding that there are currently fish consumption advisories for mercury in lakes within the study area and that watercourse realignments will result in the flooding of terrestrial lands, measures for mitigating mercury exposure have been proposed.

4.11.2 Updated Ecological Risk Assessment

The ecological receptors in the LSA are unchanged from the EA and include terrestrial receptors (e.g., soil invertebrates), terrestrial plants, mammals and birds. Aquatic receptors include aquatic vegetation (submergent and emergent), benthic communities and higher trophic level receptors including a variety of fish. The exposure pathways for ecological receptors are also unchanged from those evaluated in the EA.

In the EA, potential risks to ecological receptors were evaluated through an examination of direct exposure via airborne emissions or through deposition to soil with subsequent uptake. Unacceptable risks were not identified for either exposure pathway. With the revised configuration of the Project and concomitant reduction in airborne emissions, these conclusions are still valid.

The updated water quality assessment evaluated predicted changes in water quality resulting from changes to the Project. Arsenic was the only contaminant of concern identified where predicted concentrations resulted in an exceedance of a relevant water quality objective with maximum predicted concentrations comparable to those predicted for the EA. When compared to risk-based toxicity reference values protective of sensitive species (*Scenedesmus obliquus*) the maximum predicted concentrations are not indicative of unacceptable risk to aquatic receptors.

4.11.3 Differences from the EA

The updated human and ecological health risk assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Human and ecological health risks associated with airborne concentrations are predicted to be less than those predicted in the EA as a result of the optimized footprint. As compared to the EA, potential water quality related effects are nominally different and are considered immaterial.

4.12 Visual Aesthetics

The assessment of potential Project-related effects on visual aesthetics was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases and considered updated visual aesthetics modelling. The detailed assessment is presented in Appendix B-12.

Key differences between the EA and the Project relevant to visual aesthetics are:

- Relocation of the TMF nearer to the open pit;
- increase in TMF dam height from 45 m to 70 m;
- establishment of a separate overburden stockpile outside the footprint of the MRA;
- a reduction in the MRA capacity from 850 Mt to 559 Mt;
- revision to the location of the MRA;
- revision to the ore stockpile configuration; and
- reduction in power requirements which removes the need for the cross country 230 kV transmission line from Timmins, with the updated TLA shorter in length and using existing ROWs.

A summary of key results is presented in the following subsections.

4.12.1 Updated Effects Assessment

The viewshed analysis determined that 5 of the 10 receptor locations that were remodelled for the Project had a clear line of sight to the MRA and 1 of the 10 receptors locations had a clear line of sight to the TMF. In general, the MRA is reduced in elevation compared to the EA; the Project MRA design and visual effects to the five receptors is also reduced compared to the EA. The relocated TMF will be visible from one receptor on Schist Lake, whereas the TMF location in the EA was not visible from the receptors. Overall, the number of receptors that will have the viewscape affected by the Project is consistent with the EA.

For all Project phases, the EA conclusions remain unchanged. The Project does not have the potential to affect the visual landscape of nearby receptors during the Construction phase.

During the remaining phases, effect of the Project on the visual landscape is perceptible but will not affect enjoyment of the viewscape for the receptors.

To assess the change in landscape from non-receptor locations, a full landscape area viewshed analysis was conducted for the LSA in order to identify areas on the ground where at least the highest portions of the Project components would be visible.

Results indicate that the MRA will be the most prominent Project component, being visible from Clam Lake, Chester Lake, Three Duck Lakes, Bagsverd Lake, Delaney Lake, Rene Lake and portions of Schist Lake, Dividing Lake and Mesomikenda Lake. However, the reduced size and change in location of the MRA reduces the visibility of the structure compared to the EA layout.

Compared to the EA, the Project TMF has taller dams and has been relocated to the west of the open pit. It is predicted to be visible from Schist Lake, Bagsverd Lake, Clam Lake, Chain Lake, Chester Lake and Moore Lake. The ore stockpiles, which are a relatively small Project feature compared to the TMF and MRA, will be seen from portions of Bagsverd Lake and Three Duck Lakes, which is consistent with the EA. The overburden stockpile is predicted to be visible from Chester Lake and Clam Lake.

The Project requires the abandoned transmission line between Timmins TS and Shining Tree DS be refurbished, and re-clearing, widening, and installation of a new 44 km 115 kV transmission line between the Shining Tree DS and mine site, compared to a 120 km 230 kV transmission line assessed in the EA. Consistent with the EA, during the Construction, Operations and Closure phases, the new 44 km transmission line segment is expected to result in a perceptible change in landscape, which does not affect enjoyment of the viewscape. Following establishment of vegetation in the Post-closure phase, the ROW will eventually return to its original state. Compared to current baseline conditions, it is anticipated that this effect will no longer be perceptible.

4.12.2 Differences from the EA

The updated human and ecological health risk assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. The updated viewshed analysis determined that overall, the number of receptors that will have the viewscape affected by the Project is consistent with the EA. Overall and consistent with the EA, the effect of the Project on the visual landscape during all the phases is perceptible but will not affect enjoyment of the viewscape for the receptors.

4.13 Socio-Economics

The assessment of potential Project-related effects on socio-economics was updated and compared to the results presented in the EA. The assessment included changes to predicted effects for all Project phases, and consideration of additional statistical information about the

study area communities, and specific comments received from First Nations and Métis subsequent to submission of the EA. The detailed assessment is presented in Appendix B-13.

Key differences between the EA and the Project relevant to socio-economics are:

- A reduced processing rate from 60,000 tpd to 36,000 tpd; and
- an increase in the anticipated life of mine from 15 years to 17 years.

A summary of key results is presented in the following subsections.

4.13.1 Updated Effects Assessment

The Project's economic effects were estimated in the EA using the provincial input / output economic multipliers for Ontario as provided by the Industry Accounts Division of Statistics Canada. Although changes were made to the proposed Project description, the capital cost remains the same.

The prediction of effects for socio-economic indicators have not changed, except for the duration of effects during the Operations phase, which are anticipated to last an additional two years given the change from 15 to 17 years of mine operations. As such, the effects assessment in the EA remains valid and appropriate to the EER for all socio-economic effects indicators:

- Labour market;
- business opportunities;
- government finances;
- population and demographics;
- community health conditions;
- housing and temporary accommodations;
- public utilities;
- education;
- emergency services;
- other community services; and
- transportation.

Predicted positive effects during the Operations phase for some of the indicators are expected to be larger and span over a longer period of time (17 years instead of 15), including:

- Labour market;

- business opportunities;
- government finances; and
- population and demographics.

4.13.2 Differences from the EA

The updated socio-economic assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Overall, effects predictions have not changed, except for the duration of effects, which are anticipated to last an additional two years given the change from 15 to 17 years of mine operations.

4.14 Archaeology and Built Heritage

The assessment of potential Project-related effects on archaeology and built heritage was updated and compared to the results presented in the EA. The detailed assessment is presented in Appendix B-14.

The key difference between the EA and the Project relevant to archaeology and built heritage is the revision to Project layout, including location of the open pit, TMF, MRA, ore and overburden stockpiles, and the ore processing plant.

A summary of key results is presented in the following subsections.

4.14.1 Updated Effects Assessment

Since 2010, multiple Stage 1 to Stage 4 archaeological assessments have been undertaken in an effort to assess the archaeological potential of the lands to be developed, identify any archaeological sites, evaluate their cultural heritage value or interest (CHVI), and recommend appropriate protection and mitigation strategies according to those outlined in the Ministry of Tourism, Culture and Sport's (MTCS) *2011 Standards and Guidelines for Consultant Archaeologists*.

Since the release of the EA, additional archaeological assessments have been undertaken for the Project, including a Stage 1 background and field assessment, a Stage 2 sub-surface assessment, and a Stage 3 site monitoring assessment. The archaeological sites newly identified since the release of the EA have been listed in Appendix B-14 and provides an updated listing of all archaeological sites, and their respective assessment conditions, identified during the duration of assessment work directly involved with the Project. Additional archaeological work has been scheduled for the 2018 field season.

Several of the studies resulted in the location of previously unknown archaeological sites, both pre-contact and post-contact. While many of these sites have been mitigated or are outside the area of development, several remain which require further archaeological work.

A total of 6 Stage 3 site-specific archaeological assessments are planned for the 2018 field season. It is unknown at this time if additional Stage 4 mitigation work will be required as this is dependent on the results from the Stage 3 assessment. The sites which have been selected for Stage 3 work in 2018 include: Mollie River 1 which is located at the outlet of the Mollie River from Chester Lake; Upper Duck Pine Point and Upper Three Duck Lake 3, located in the vicinity of the proposed dam across Three Duck Lake (Upper); and Upper Three Duck Lake 1 and 2 as well as Weeduck Lake 1 located in the area between Three Duck Lake (Upper) and Weeduck Lakes.

Several of the sites, located during earlier studies, have continued cultural heritage value or interest, but currently lie outside of the planned development. These sites include: the Lookout Site on Chester Lake; the Rocky Island Campsite and the Table Point Site located on Bagsverd Lake; Bagsverd Creek 1, 3 and 4, located on sections or tributaries of Bagsverd Creek; Headframe Point Site on Clam Lake; the Cryderman Site on Three Duck Lake (Lower); and finally, the Cryderman Camp located to the east of Moore Lake. Should the development plans change at some time in the future these sites may require additional archaeological assessment work.

The vast majority of the fieldwork undertaken on the Côté Gold Property has directly involved members of Mattagami First Nation (MFN), and during the 2012 and 2013 field seasons, a member of Flying Post First Nation (FPFN).

Additionally, changes in MTCS protocols regarding the transfer of artifacts were identified which require artifact collections to be curated in public institutions. As such, consultations are currently underway with MFN and FPFN to identify an appropriate public institution and to coordinate the transfer of artifact collections to said institution.

A built heritage assessment was carried out for the EA. At the conclusion of the study, it was determined that no further concerns were present with regard to built heritage environments. If in the future additional built heritage features are located, they will be assessed by a built heritage specialist.

4.14.2 Differences from the EA

The updated archaeological and built heritage assessment demonstrates that predicted effects for the optimized Project are similar or reduced compared to the EA. Archaeological and built heritage assessments have continued to be carried out throughout the past 8 years on properties associated with the Project. Since the submission of the EA, additional

archaeological field work has been conducted resulting from the optimizations of the Project site plan. New archaeological sites have been identified and revisions have been made to the CHVI statuses and mitigative measures for a number of previously-identified archaeological sites.

5.0 UPDATED MITIGATION MEASURES

Mitigation measures are means to prevent, reduce or control adverse environmental effects of a project, and include restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means. The objectives of the mitigation measures are to:

- Protect the physical, biological and human environments;
- manage mineral wastes;
- manage hazardous compounds and wastes; and
- provide the basis for the development of monitoring plans.

The updates to proposed mitigation measures for the identified effects resulting from the EER for the various disciplines of the physical, biological and human environment are summarized in Tables 5-1, 5-2 and 5-3 respectively. Descriptions have been provided of how and why these measures differ from the EA, if and where applicable. A consolidated list of mitigation measures for the Project, including those which remain unchanged from the EA, are included in Appendix C-1.

The proposed mitigation measures for the Project follow good industry mitigation and management practices for mining projects and serve as the basis for the development of environmental management plans and monitoring programs. IAMGOLD will revise those mitigation measures, as required, based on environmental management plans and monitoring.

Monitoring will allow for continual assessment of the effectiveness of these mitigation measures. As new information becomes available through these monitoring programs, selected mitigation measures may be revised if they prove less effective than anticipated. Environmental management and monitoring plans are described in Chapter 7.

5.1 Updated Mitigation Measures – Physical Environment

Table 5-1 summarizes updates to proposed mitigation measures for effects to the physical environment and provides a description as to how and why they differ from the EA.

Table 5-1: Updated Mitigation Measures – Physical Environment

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Air Quality	There are no changes to the mitigation measures for air quality compared to the EA.					
Noise and Vibration	Operations	Operational noise at the receptors.	Site equipment will be operated to meet NPC-300 operational noise limits. Alternatively, to meet NPC-300 night-time criteria, sensitive receptors may be purchased.	Some equipment (air track drill, track dozer) may be limited to daytime operation. Haul truck traffic limitations for night time operations may be applied.	Compliance with NPC-300 for operational noise limit of 45 dBA during daytime and 40 dBA during night-time.	Mitigation measure no longer applicable. Nighttime operation restriction is no longer required as the predicted sound levels meet the nighttime criteria limit. The change in site layout and reduced production rate helped to lower noise impact at the receptors. Purchase of noise sensitive receptors may not be required as the project noise impact at the receptors is predicted to be within the limits.
Hydrogeology	There are no changes to the mitigation measures for hydrogeology compared to the EA.					
Hydrology and Climate	There are no changes to the mitigation measures for hydrology and climate compared to the EA.					
Water Quality	There are no changes to the mitigation measures for water quality compared to the EA.					

5.2 Updated Mitigation Measures – Biological Environment

Table 5-2 summarizes updates to proposed mitigation measures for effects to the biological environment and provides a description as to how and why they differ from the EA.

Table 5-2: Updated Mitigation Measures – Biological Environment

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Terrestrial Biology	Construction, Operations, Closure	Direct vegetation (and wildlife habitat) loss, alteration, and fragmentation from the physical footprint of the Project.	Limit the area of Project footprint and limit disturbance from employees and mining activities. No vegetation removal is to occur during sensitive wildlife breeding seasons such as the migratory bird nesting season (April 15 to August 31). Construct the transmission line to minimize the potential for ground disturbance and soil erosion during construction and to reduce the necessity for creation of additional permanent access	Existing access roads and infrastructure used to the extent practical in transmission line construction. Vegetation clearing to take place outside of the migratory bird nesting season (April 15 to August 31). If under unforeseen circumstances minor vegetation removal is necessary between April 15 and August 31, non-intrusive surveys such as point counts for singing male birds will be completed by qualified individuals. If singing males are recorded, then it will be assumed that a	*Canadian Migratory Birds Convention Act*	Mitigation measure updated. The mitigation measure no longer needs to include the construction of the 230 kV transmission line. The Project no longer requires a dedicated 230 kV transmission line; therefore, the Project will tie into an existing 115 kV transmission line at the Shining Tree location. Migratory Bird Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols. All other components of

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Terrestrial Biology	(Cont.) Construction, Operations, Closure	(Cont.) Direct vegetation (and wildlife habitat) loss, alteration, and fragmentation from the physical footprint of the Project.	roads. Retain existing low-lying vegetation along the transmission line ROW thereby minimizing vegetation clearing and allowing for the maintenance of root masses and ground vegetation that will reduce the potential for erosion and encourage continued vegetation growth through operations and beyond closure. Where practical, use existing roads and trails. Where practical, rehabilitate habitat for plants and wildlife.	nesting female is nearby, and proper provincial and federal species-specific nest buffers will be established around the singing male; no vegetation removal will occur within these buffers between April 15 and August 31. A mitigation / management plan will be developed in consultation with Environment Canada and the Ministry of Natural Resources to address potential impacts to breeding birds. Retain existing low ground cover along transmission line ROW thereby minimizing vegetation clearing. Maintain vegetated buffers adjacent to creek and river transmission line crossings.	(Cont.) *Canadian Migratory Birds Convention Act*	the mitigation measure have remained the same as presented in the EA.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Terrestrial Biology	Construction, Operations, Closure	Direct vegetation (and wildlife habitat) loss, alteration, and fragmentation from the physical footprint of the Project.	Limit the area of Project footprint and limit disturbance from employees and mining activities. No vegetation removal is to occur during sensitive wildlife breeding seasons such as the migratory bird nesting season (April 15 to August 31). Construct the transmission line to minimize the potential for ground disturbance and soil erosion during construction and to reduce the necessity for creation of additional permanent access	Apply and enforce speed limits along all Project access roads and always give the right-of-way to wildlife. Vehicle use will be restricted to designated areas and use of off-road vehicles for recreational purposes will be prohibited for workers. Progressive revegetation will be implemented where practical to reduce the amount of disturbed habitat during the Project lifecycle and will include active seeding to promote vegetation growth, stabilize the substrate, reduce potential erosion	*Canadian Migratory Birds Convention Act*	Mitigation measure updated. The mitigation measure no longer needs to include the construction of the 230 kV transmission line. The Project no longer requires a dedicated 230 kV transmission line; therefore, the Project will tie into an existing 115 kV transmission line at the Shining Tree location. Migratory Bird Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Terrestrial Biology	(Cont.) Construction, Operations, Closure	(Cont.) Direct vegetation (and wildlife habitat) loss, alteration, and fragmentation from the physical footprint of the Project	roads. Retain existing low-lying vegetation along the transmission line ROW thereby minimizing vegetation clearing and allowing for the maintenance of root masses and ground vegetation that will reduce the potential for erosion and encourage continued vegetation growth through operations and beyond closure. Where practical, use existing roads and trails. Where practical, rehabilitate habitat for plants and wildlife.	and enhance natural recovery of vegetation communities.	(Cont.) *Canadian Migratory Birds Convention Act*	All other components of the mitigation measure have remained the same as presented in the EA.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Terrestrial Biology	Construction, Operations, Closure	Direct vegetation (and wildlife habitat) loss, alteration, and fragmentation from the physical footprint of the Project	Reduce the risk of mortality to birds and bats.	Use bird/bat deterrents / deflectors on transmission lines in high use areas (e.g., waterfowl movement corridors).	*Canadian Migratory Birds Convention Act*	Mitigation measure updated. The Project no longer requires a dedicated 230 kV transmission line; however, the mitigation measure still applies to any construction enabling the tie in to the 115 kV transmission line at the Shining Tree location and from the Shining Tree substation to the Project site.
Terrestrial Biology	Construction, Operations, Closure	Project preparation, construction, operation and closure activities can increase the risk of nest destruction and mortality of migratory birds (incidental take).	Limit risk of nest destruction and mortality of migratory birds.	Typically, clearing of vegetation will take place outside of the migratory bird nesting season (April 15 to August 31). If under unforeseen circumstances minor vegetation removal is necessary between April 15 and August 31, non-intrusive surveys such as point counts for singing male birds will be completed by qualified individuals. If singing males are recorded, then it will be assumed that a nesting female is nearby,	*Canadian Migratory Birds Convention Act*	Mitigation measure updated. Migratory Bird Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols. All other components of the mitigation measure have remained the same as presented in the EA.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Terrestrial Biology	(Cont.) Construction, Operations, Closure	(Cont.) Project preparation, construction, operation and closure activities can increase the risk of nest destruction and mortality of migratory birds (incidental take).	(Cont.) Limit risk of nest destruction and mortality of migratory birds.	and proper provincial and federal species-specific nest buffers will be established around the singing male; no vegetation removal will occur within these buffers between April 15 and August 31. A mitigation/ management plan will be developed in consultation with Environment Canada and the MNRF to address potential impacts to breeding birds. Minimize disturbance to active nest sites.	(Cont.) *Canadian Migratory Birds Convention Act*	(Cont.) Mitigation measure updated. Migratory Bird Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols. All other components of the mitigation measure have remained the same as presented in the EA.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Terrestrial Biology	Construction	Adverse effects to migratory birds and avian SAR due to loss of habitat or noise disturbance.	Minimize the Project footprint to the extent practicable. Construction and clearing within the transmission line ROW outside migratory bird breeding season (April 15 to August 31). Maintain existing vegetation ground cover along the transmission line ROW to the extent practicable. Install conductor wires at a sufficient distance apart to prevent the accidental electrocution (contact of wingtips with wire) of large avian species. Utilize existing infrastructure for access and minimize construction of new roads and other corridors where	Minimize the width of the transmission line ROW to the proposed 50 m. Construct in winter, where frozen surfaces are required to minimize surface erosion. Retain existing low-lying vegetation ground cover along the transmission line ROW thereby minimizing vegetation clearing. Utilize existing infrastructure for access and minimize construction of new roads. No hunting by Project personnel will be permitted while working or residing on-site. Enforce speed limits along Project roads. Include wildlife awareness information in regular safety and environmental inductions.	*Canadian Migratory Birds Convention Act*	Mitigation measure updated. Migratory Bird Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols. All other components of this mitigation measure have not changed notably from the EA. As the Project no longer involves construction of a new dedicated transmission line the wording has been changed to reflect the same measure applies to any construction and clearing within the existing ROW.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Terrestrial Biology	(Cont.) Construction	(Cont.) Adverse effects to migratory birds and avian SAR due to loss of habitat or noise disturbance	possible. Advise Project personnel not to interfere or harass wildlife. Include Common Nighthawk and Bank Swallow identification as part of site induction to improve success of wildlife reporting programs. Contact the MNRF and Environment Canada within 24 hours if Common Nighthawk or Bank Swallow are recorded nesting on site. No hunting by Project personnel permitted while working or residing on-site. Educate Project personnel on how to handle food and food wastes in a responsible manner and create and enforce policies to ensure no feeding of wildlife.	(Cont.) Minimize the width of the transmission line ROW to the proposed 50 m. Construct in winter, where frozen surfaces are required to minimize surface erosion. Retain existing low-lying vegetation ground cover along the transmission line ROW thereby minimizing vegetation clearing. Utilize existing infrastructure for access and minimize construction of new roads. No hunting by Project personnel will be permitted while working or residing on-site. Enforce speed limits along Project roads. Include wildlife awareness information in regular safety and environmental inductions.	(Cont.) *Canadian Migratory Birds Convention Act*	(Cont.) Mitigation measure updated. Migratory Bird Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols. All other components of this mitigation measure have not changed notably from the EA. As the Project no longer involves construction of a new dedicated transmission line the wording has been changed to reflect the same measure applies to any construction and clearing within the existing ROW.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Terrestrial Biology	Construction	Adverse effects to raptors due to loss of habitat or noise disturbance.	Develop a compact site to prevent encroachment of Project activities on raptor nesting sites and adjacent habitat. Minimize the level of potentially disturbing activities near any known or subsequently discovered active raptor nest sites during the raptor breeding season (April 15 – August 31) until nests are vacated. Dispose of food wastes generated on site in an appropriate manner that limits the attraction of wildlife, including Common Ravens, Turkey Vultures and Bald Eagles. Remove carcasses of road-killed animals or any other carcasses found onsite in a timely manner to limit the attraction of wildlife, such as Common Ravens and Turkey Vultures.	Minimize the width of the transmission line ROW to the proposed 50 m. Dispose of food wastes generated on site in an appropriate manner. Remove carcasses of road-killed animals or any other carcasses found onsite in a timely manner.	*Canadian Migratory Birds Convention Act*	Mitigation measure updated. Raptor Nesting Season dates have been changed to April 15 to August 31 to reflect updated government standards and protocols. All other components of the mitigation measure have remained the same as presented in the EA.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Aquatic Biology	Construction	Reduction in flow associated with the loss of the TMF drainage to Bagsverd Creek will reduce flow and water levels and could affect fish passage and use of habitats.	Predicted reductions in flow will be compared to the measured stream morphology and the stream bed will be modified, as required to ensure fish passage and utilization of habitats. The modifications should be conducted as part of the fish habitat compensation plan.	Conduct a survey of the stream morphology at critical times of the year (low and peak flows) and assess the potential impact to habitat associated with predicted reductions in flow and water levels. Incorporate streambed modifications into the habitat compensation plan, if required.	*Fisheries Act* Section 35. No loss of productive habitat related to commercial, aboriginal or recreational fisheries.	Mitigation measure no longer applicable. Loss of habitat associated with reduction in flow is not anticipated under the Project plan in Bagsverd Creek, or in any other habitats and therefore this mitigation is no longer required.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Aquatic Biology	Construction, Operations	Blasting in the open pit during construction may affect spawning success and limit habitat utilization by some fish in water bodies adjacent to the open pit. However, the area affected is primarily profundal habitat and is of limited value for fish spawning thus any effects are expected to be minimal.	The spawning habitat within the water bodies affected will be included in the Fisheries Act Authorization for the site as a loss of habitat and will be addressed through the compensation plan.	Spawning habitat in Clam Lake within 238.5 m from open pit will be included in the Fisheries Act Authorization and ensuing compensation plan.	DFO guideline - Wright D-G., and Hopky G-E., 1998. Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters. Fisheries Act Section 35. No loss of productive habitat related to commercial, aboriginal or recreational fisheries.	Mitigation measure updated. There are two areas where fish habitat quality will potentially be affected during construction; Clam Lake and New Lake. The potential disruption in habitat will be addressed through the offsetting / compensation plan.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Aquatic Biology	Operations	Maximum values of several substances are predicted to exceed water quality guidelines in a few locations, but concentrations of most substances are less than acute toxicity values appropriate for the	Since toxicity of these substances can be modified by factors within the receiving environment such as hardness, dissolved organic carbon and pH, the predicted concentrations may not result in effects to aquatic biota. Site specific water quality objectives will need to be developed for these substances or effluent treatment will need to be employed such that protection of aquatic life	Prepare site-specific water quality guidelines following CCME protocols.	Water quality outside the mixing zone will need to achieve water quality guidelines and within the mixing zone must be non-acutely toxic to aquatic life– Ontario *Water Resources Act* (OWRA) and Section 36 of the	Mitigation measure no longer applicable. Metals are not predicted to exceed water quality guidelines, with the exception of arsenic during the dry year (1 in 25 yr) scenario. However, toxicity thresholds are not predicted to be exceeded even in the dry year. While mixing zone modelling will be required to support permitting, it is not anticipated that site specific water quality

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Aquatic Biology	(Cont.) Operations	assessment of short term exposure. Copper, iron and zinc will periodically exceed water quality guidelines in the effluent mixing zone with potential for short term effects to aquatic life.	is assured. To ensure that effluent is non-toxic, IAMGOLD will commit to a pH effluent limit of 6.7 to 9.0.	(Cont.) Prepare site-specific water quality guidelines following CCME protocols.	*Fisheries Act*	guidelines will be required.

5.3 Updated Mitigation Measures – Human Environment

Table 5-3 summarizes updates to proposed mitigation measures for effects to the human environment and provides a description as to how and why they differ from the EA.

Table 5-3: Updated Mitigation Measures – Human Environment

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Land and Resource Use	Construction, Operations, Closure	Maintain access for mineral exploration	Work with claim holders to identify access changes and negotiate access agreements if there is any requirement to use or cross IAMGOLD properties.	Negotiate access as necessary and maintain access agreements.	As per existing access agreements and exploration permit (*Mining Act*)	Mitigation measure no longer applicable. No longer required as IAMGOLD secured all mining claims within the Project footprint.
Land and Resource Use	Construction, Operations, Closure	Maintain access to cottage on Schist Lake	Provide road alternate access to cottages north of Schist Lake	IAMGOLD will provide alternative road access to the cottages north of Schist Lake.	n/a	New mitigation measure.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Land and Resource Use	Construction, Operations	Navigable Waters – restricted access to the 4M Circle Canoe Route	To be determined through consultation with any potential canoe route users to facilitate safe navigation during Construction and Operations.	Through consultation with users, establish a suitable portage / connection such that the portage route will still be usable, or an alternative route is developed. This could also include placing markers to ensure canoes do not approach active construction sites. The area will be posted with signage indicating which camp sites are closed and access is limited to a period of 24-hours. If the need arises the area can be monitored.	*Navigation Protection Act*	Mitigation measure updated. Updated to remove reference to diversion dams in Three Duck Lakes and Bagsverd Lake as the previously affected waterways are no longer being re-routed. Clarification about the area signage was also updated.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Traditional Land Use	Construction, Operations	Canoeing (traditional) – loss of portage route	To be determined through consultation with any potential canoe route users to facilitate *safe* navigation during construction and operations.	Through consultation with users, establish a suitable portage/ connection such that the portage route will still be usable, or an alternative route is developed. *The area will be posted with signage indicating which camp sites are closed and access is limited to a period of 24-hours. If the need arises the area can be monitored. Notification processes related to land access controls and/or activity restrictions on current use will be developed in consultation with affected Indigenous groups, in consideration of individual consultation preferences of each community and consistent with any potential commercial agreements.*	*Navigation Protection Act*	Mitigation measure updated. Text in italics was added post-EA submission in response to comments received during the EA review period. This update to the mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016. Clarification about the area signage was also updated.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Traditional Land Use	Construction, Operations	Cultural, Spiritual and Ceremonial Sites, Eagle's Nest – impacts to raptors	Inform workers of locally nesting raptors. *Consult with Mattagami First Nation and Flying Post First Nation on how the removal of an eagle's nest can be conducted in a culturally sensitive manner and be open to hosting a traditional ceremony (ies) on site should one be requested.*	Inform workers of locally nesting raptors to avoid unnecessary disturbance.	n/a	Mitigation measure updated. Text in italics was added post-EA submission in response to comments received during the EA review period. This update to the mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Traditional Land Use	Construction, Operations, Closure	Impacts on the exercise of Indigenous rights by the Métis rights-bearing community in the Project Area	*Through a memorandum of understanding, dated June 21, 2014, as amended by an Addendum dated February 1, 2016 (collectively, the "MOU"), Trelawney, a wholly-owned subsidiary of IAMGOLD, and the Métis Nation of Ontario intend to continue to develop a positive relationship and, should the Project receive regulatory approval, further commit to reaching an agreement on an Impact Benefit Agreement if*	IAMGOLD will continue to engage with the Métis community to address community priorities and potential impacts arising from the Project in accordance with the mechanisms outlined in the MOU.	n/a	New mitigation measure. Added post-EA submission in response to comments received during the EA review period. This update to the mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with the CEA Agency, MOECC and Wabun Tribal Council in February 2016. Since February 2016, the commitment description was further updated to remove reference to Trelawney as it is no longer applicable.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Traditional Land Use	(Cont.) Construction, Operations, Closure	(Cont.) Impacts on the exercise of Indigenous rights by the Métis rights-bearing community in the Project Area	*commercially reasonable terms can be arrived at by the parties in accordance with the MOU. The agreement will aim to address mutually agreeable interests such as (i) terms for financial benefits, (ii) compensation relating to any specific and identifiable Project impacts which are not otherwise resolved through mitigation or accommodation, and (iii) other key areas including training, employment, environmental monitoring/management and business opportunities.*	(Cont.) IAMGOLD will continue to engage with the Métis community to address community priorities and potential impacts arising from the Project in accordance with the mechanisms outlined in the MOU.	(Cont.) n/a	(Cont.) New mitigation measure. Added post-EA submission in response to comments received during the EA review period. This update to the mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with the CEA Agency, MOECC and Wabun Tribal Council in February 2016. Since February 2016, the commitment description was further updated to remove reference to Trelawney as it is no longer applicable.
Human and Ecological Health Risk	There are no changes to the mitigation measures for Human and Ecological Health Risk compared to the EA.					
Visual Aesthetics	There are no changes to the mitigation measures for Visual Aesthetics compared to the EA.					

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Socio-Economic	Construction, Operations	Labour Market / Population Demographics – local employment	Support employment of local community members where possible.	Support employment for local community members (First Nation, Métis communities and Gogama) *including opportunities to support environmental monitoring activities.*	n/a or as established in negotiated agreements.	Mitigation measure updated. Text in italics was added post-EA submission in response to comments received during the EA review period.
Socio-Economic	Construction, Operations, Closure	Impacts on the exercise of Aboriginal* rights by the Métis rights-bearing community in the Project Area *Indigenous (previously referred to as Aboriginal in the EA), original wording maintained for consistency in wording comparison.	*Through a memorandum of understanding, dated June 21, 2014, as amended by an Addendum dated February 1, 2016 (collectively, the "MOU"), Trelawney, a wholly-owned subsidiary of IAMGOLD, and the Métis Nation of Ontario intend to continue to develop a positive relationship and, should the Project receive regulatory approval, further commit to reaching an agreement on an Impact Benefit Agreement if*	IAMGOLD will continue to engage with the Métis community to address community priorities and potential impacts arising from the Project in accordance with the mechanisms outlined in the MOU.	n/a	New mitigation measure. Added post-EA submission in response to comments received during the EA review period. This mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016. Since February 2016, the commitment description was further updated to remove reference to Trelawney as it is no longer applicable.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
(Cont.) Socio-Economic	(Cont.) Construction, Operations, Closure	(Cont.) Impacts on the exercise of Aboriginal* rights by the Métis rights-bearing community in the Project Area *Indigenous (previously referred to as Aboriginal in the EA), original wording maintained for consistency in wording comparison.	*commercially reasonable terms can be arrived at by the parties in accordance with the MOU. The agreement will aim to address mutually agreeable interests such as (i) terms for financial benefits, (ii) compensation relating to any specific and identifiable Project impacts which are not otherwise resolved through mitigation or accommodation, and (iii) other key areas including training, employment, environmental monitoring/management and business opportunities.*	(Cont.) IAMGOLD will continue to engage with the Métis community to address community priorities and potential impacts arising from the Project in accordance with the mechanisms outlined in the MOU.	(Cont.) n/a	(Cont.) New mitigation measure. Added post-EA submission in response to comments received during the EA review period. This mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016. Since February 2016, the commitment description was further updated to remove reference to Trelawney as it is no longer applicable.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Socio-Economic	Construction, Operations, Closure	Unidentified Project-related socio-economic / community effects	*Management plan to address potential Project-related socio-economic / community effects.*	IAMGOLD will work with potentially affected Aboriginal groups to develop a socio-economic / community management plan to address potential Project-related socio-economic / community effects identified through the environmental assessment process and/or at later stages of the Project	n/a or as established in negotiated agreements.	New mitigation measure. Added post-EA submission in response to comments received during the EA review period. This mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016.
Socio-Economic	Construction, Operations	Labour Market / Population Demographics – training to access Project employment	Support and/or provide training and education in local communities, where possible.	Support and/or provide education and training for potential employees from local communities (Aboriginal communities and members of Gogama). Initiate discussions with potential partners for developing youth mentorship programs. *Work with appropriate community contacts to identify training needs, develop relevant training plans, and identify potential participants.*	n/a or as established in negotiated agreements.	Mitigation measure updated. Text in italics was added post-EA submission in response to comments received during the EA review period. This update was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016.

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Socio-Economic	Construction, Operations, Closure	Transportation – potential for wildlife-vehicular accidents	Report wildlife sightings on highways. *Implement a wildlife observation log for all mammals (and road kill) on or near the Project roads.*	Report wildlife sightings on highways and on or near Project roads to inform workers and identify areas where wildlife is persistently present.	n/a	Mitigation measure updated. Text in italics was added post-EA submission in response to comments received during the EA review period. This update to the mitigation was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Wabun Tribal Council in February 2016.
Archaeology	Construction, Operations, Closure	Disturbance to archaeological sites	Archaeological assessments Stages 1, 2, 3 and 4, as required	Archaeological assessment at identified areas when sub-surface impacts are anticipated; monitoring, as required, of secondary impacts (i.e., erosion) when present	MTCS Regulations	The accepted approach to site mitigation (i.e. completion of Stage 1-4 archaeological assessments, as required) has not changed from the EA. Site-specific mitigation measures and future work recommendations have been updated from the EA (see Appendices B-14 and C-2).

Discipline	Project Phase	Issue / Concern / Interaction	Mitigation Measure	Description / Commitment	Standard	Comparison between EA and EER
Archaeology	Construction, Operations, Closure	Storage of artifacts	Transfer excavated artifacts to a public storage and curation facility for long-term protection	Active consultation with MFN to coordinate the transfer of all artifact collections in accordance with MTCS protocols after analysis has been completed along with a community presentation. An MTCS collection transfer form will be completed by the surrendering licensee(s) and MFN and collections shall be curated to such standards in a public institution or other location as approved by MTCS.	MTCS Regulations	*Mitigation measure updated.* *Changes in MTCS protocols regarding the curation and storage of artifacts state that collections must now be curated in public institutions, or other locations approved by MTCS. As such, discussions with MFN are in progress to identify suitable public institution(s) and coordinate the transfer of artifact collections*
Archaeology	Construction	Exposure of potential marine archaeological resources or values	Monitor the dewatering of Côté Lake, as per previous requirements of MTCS.	A licensed archaeologist and First Nation monitor is required to monitor the dewatering event.	n/a (as requested by the MOECC and agreed to by MTCS)	*New mitigation measure.* *Approach to inspecting newly-exposed shorelines not previously included in archaeology section of EA Technical Support Document*

6.0 UPDATED IMPACT ASSESSMENT

6.1 Methodology

The significance of each environmental effect (effect) described in Chapter 4 is determined through assessment criteria. The same five assessment criteria used in the EA report were used in this EER to determine the significance of the residual adverse effects, or impacts, which may remain after considering the application of mitigation measures described in Chapter 5, as follows:

- Magnitude – a qualitative or quantitative measure to describe the size or degree of the effects relative to baseline conditions;
- Geographic extent – the area on, or through which each effect will take place;
- Duration – the time period over which the effect will, or is expected to occur;
- Frequency – the rate of occurrence of the effect; and
- Reversibility – the extent to which the effect can be reversed.

Table 6-1 presents the definition of the assessment levels for each of the assessment criteria presented above. The definitions apply for the physical, biological and human environment disciplines and indicators.

Table 6-1: Impact Assessment Criteria Levels Definitions

Assessment Criteria	Level I	Level II	Level III
Magnitude	The magnitude is defined for each indicator, see Table 6-2.		
Geographic Extent	Effect is restricted to the Project footprint.	Effect extends into the local study area.	Effect extends into the regional study area.
Duration	The duration of the effect is less than or equal to 2 years.	The duration of the effect is between 2 and 15 years (or Operations).	The duration of the effect is beyond 15 years (or Operations).
Frequency	Effect occurs infrequently.	Effect occurs intermittently or with a certain degree of regularity.	Effect occurs frequently or continuously.
Reversibility	Effect is fully reversible.	Effect is partially reversible.	Effect is not reversible.

6.1.1 Magnitude

The definition of the magnitude assessment criteria for each of the physical, biological and human effects assessment indicator is presented in Table 6-2.

Table 6-2: Magnitude Assessment Criteria Definitions

Discipline	Indicator	Level I	Level II	Level III
Air Quality	Suspended Particulate Matter (Dust) as Total Particulate Matter ($PM_{tot.}$)	Concentrations are comparable to baseline levels (21.4 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<120 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>120 µg/m^3).
Air Quality	Suspended Particulate Matter (Dust) as Particulate Matter (PM_{10}); 24 Hour Average	Concentrations are comparable to baseline levels (13.9 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<50 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>50 µg/m^3).
Air Quality	Suspended Particulate Matter (Dust) as Fine Particulate Matter ($PM_{2.5}$); 24 Hour Average	Concentrations are comparable to baseline levels (9.8 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<25 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>25 µg/m^3).
Air Quality	Suspended Particulate Matter (Dust) as Fine Particulate Matter ($PM_{2.5}$); Annual Average	Concentrations are comparable to baseline levels (4.2 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<8.8 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>8.8 µg/m^3).
Air Quality	Sulphur Oxides (SO_x), mainly as Sulphur Dioxide (SO_2)	Concentrations are comparable to baseline levels.	Concentrations are below Federal and/or Provincial criteria.	Concentrations exceed Federal and/or Provincial criteria.
Air Quality	Nitrogen Dioxide (NO_2); 24 Hour average	Concentrations are comparable to baseline levels (24.6 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<200 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>200 µg/m^3).
Air Quality	Nitrogen Dioxide (NO_2); 1 Hour Average	Concentrations are comparable to baseline levels (24.6 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<400 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>400 µg/m^3).
Air Quality	Arsenic; 24 Hour Average	Concentrations are comparable to baseline levels (0.0018 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<0.3 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>0.3 µg/m^3).

Discipline	Indicator	Level I	Level II	Level III
Air Quality	Lead	Concentrations are comparable to baseline levels.	Concentrations are below Federal and/or Provincial criteria.	Concentrations exceed Federal and/or Provincial criteria.
Air Quality	Manganese; 24 Hour Average	Concentrations are comparable to baseline levels (0.0055 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<0.2 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>0.2 µg/m^3).
Air Quality	VOCs	Concentrations are comparable to baseline levels.	Concentrations are below Federal and/or Provincial criteria.	Concentrations exceed Federal and/or Provincial criteria.
Air Quality	Other Key Metals	Concentrations are comparable to baseline levels.	Concentrations are below Federal and/or Provincial criteria.	Concentrations exceed Federal and/or Provincial criteria.
Air Quality	Hydrogen Cyanide (HCN); 24 Hour Average	Concentrations are comparable to baseline levels (0.18 µg/m^3).	Concentrations are below Federal and/or Provincial criteria (<8 µg/m^3).	Concentrations exceed Federal and/or Provincial criteria (>8 µg/m^3).
Noise & Vibration	Daytime Noise Level	Noise level below or equal to daytime baseline of 44 dBA.	Noise level above daytime baseline (44 dBA) and below or equal to 45 dBA.	Noise level above 45 dBA.
Noise & Vibration	Nighttime Noise Level	Noise level below or equal to nighttime baseline of 34 dBA.	Noise level above nighttime baseline (34 dBA) and below or equal to 40 dBA.	Noise level above 40 dBA.
Noise & Vibration	Blasting Noise Level	Blasting noise level below or equal to the adjusted baseline noise level of 39 dBA.	Blasting noise level above the adjusted baseline noise level (39 dBA) but below the regulatory limit of 120 dBL	Blasting noise level above of the 120 dBL regulatory limits.
Noise & Vibration	Blasting Vibration Level	Blasting vibration level at the receptor is below the perceptible vibration level (0.14 mm/s).	Blasting vibration level at the receptor is above perceptible vibration level (0.14 mm/s) and below the regulatory limit (10 mm/s).	Blasting vibration level is above the 10 mm/s regulatory limit, which is a concern for building damage.
Hydrogeology	Groundwater Levels (Water Table)	Change in the water table elevation is predicted to be less than 1 m.	Change in the water table elevation is predicted to be between 1 and 5 m.	Change in the water table elevation is predicted to be greater than 5 m.

Discipline	Indicator	Level I	Level II	Level III
Hydrology	Change in Flow	<10% or a change in flow which does not affect the hydrological characteristics.	10-30% and has the potential to affect the hydrological characteristics.	>30% and considerably changes the hydrological characteristics.
Water Quality	Change in Water Quality	Concentrations less than baseline concentrations.	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Concentrations greater than baseline concentrations and greater than water quality guidelines, where applicable.
Terrestrial Biology	Upland Plant Community Types	There is no measurable residual effect to the abundance and distribution of plant populations and communities.	The residual effect to the abundance and distribution of plant populations or communities is measurable, but the changes are well within the predicted adaptive capability to be self-sustaining.	The residual effect to the abundance and distribution of plant populations or communities is expected to be large enough that the changes are approaching the predicted adaptive capability limits to be self-sustaining.
Terrestrial Biology	Wetlands	There is no measurable residual effect to the abundance and distribution of plant populations and communities.	The residual effect to the abundance and distribution of plant populations or communities is measurable, but the changes are well within the predicted adaptive capability to be self-sustaining.	The residual effect to the abundance and distribution of plant populations or communities is expected to be large enough that the changes are approaching the predicted adaptive capability limits to be self-sustaining.
Terrestrial Biology	Vegetation Species at Risk, Species of Special Concern and Provincially Rare Species	There is no measurable residual effect to the abundance and distribution of plant populations and communities.	The residual effect to the abundance and distribution of plant populations or communities is measurable, but the changes are well within the predicted adaptive capability to be self-sustaining.	The residual effect to the abundance and distribution of plant populations or communities is expected to be large enough that the changes are approaching the predicted adaptive capability limits to be self-sustaining.

Discipline	Indicator	Level I	Level II	Level III
Terrestrial Biology	Ungulates	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology	Furbearers	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology	Migratory Birds	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology	Wildlife Species at Risk	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.

Discipline	Indicator	Level I	Level II	Level III
Terrestrial Biology - TL	Vegetation Communities	There is no measurable residual effect to the abundance and distribution of plant populations and communities.	The residual effect to the abundance and distribution of plant populations or communities is measurable, but the changes are well within the predicted adaptive capability to be self-sustaining.	The residual effect to the abundance and distribution of plant populations or communities is expected to be large enough that the changes are approaching the predicted adaptive capability limits to be self-sustaining.
Terrestrial Biology - TL	Ungulates - Moose	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology - TL	Furbearers - Wolves	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology - TL	Furbearers - American Marten	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.

Discipline	Indicator	Level I	Level II	Level III
Terrestrial Biology - TL	Furbearers - Black Bear	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology - TL	Bats	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology - TL	Migratory Birds	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Terrestrial Biology - TL	Raptors	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.

Discipline	Indicator	Level I	Level II	Level III
Terrestrial Biology - TL	Species at Risk, Species of Special Concern and Provincially Rare Species	There is no measurable residual effect to population abundance and distribution.	The residual effect to population abundance and distribution is measurable, but the changes are well within the predicted adaptive capability and resilience limits of the effects assessment indicator.	The residual effect to population abundance and distribution is large enough that the changes are near or exceeding the predicted adaptive capability and resilience limits of the effects assessment indicator.
Aquatic Biology	Aquatic Toxicity	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Maximum concentrations greater than guidelines but less than acute toxicity thresholds for resident species.	Median concentrations greater than guidelines but less than sub-lethal toxicity thresholds.
Aquatic Biology	Commercial, Recreational and Aboriginal Fisheries	There is no measurable residual effect to communities or populations.	Project activities expected to limit or reduce some life history requirements but measurable population level effects not expected.	Project activities are expected to have measurable effects on one or more of the populations.
Aquatic Biology	Loss of Aquatic Habitat	Less than 10% of lotic habitat (stream length - m) and /or lentic habitat (lake area - m^2) within the local study area.	Greater than 10% of lotic habitat (stream length - m) and /or lentic habitat (lake area - m^2) but less than 35% within the local study area.	Greater than 35% of lotic habitat (stream length - m) and /or lentic habitat (lake area - m^2) within the local study area.
Land and Resource Use	Land Use Plans and Policies	The Project does not overlap incompatible areas with approved land use plans and policies.	The Project overlaps very small portions of land use areas that may be incompatible with mining activities but will not impede the designated land use.	The Project overlaps with land use areas that may be incompatible with mining activities and may impede the designated land use but does not result in a requirement for substantive changes in the land use plan or policy.

Discipline	Indicator	Level I	Level II	Level III
Land and Resource Use	Mineral Exploration	The Project does not overlap other claim areas.	The Project overlaps or changes access to other mining claims but does not limit the ability to exercise exploration activities.	The Project overlaps or changes access to other mining claims and limits the ability to exercise exploration activities.
Land and Resource Use	Forestry	The Project does not overlap with forest management units.	The Project overlaps very small areas of forest management units but does not substantially limit forestry resources or the ability to conduct forestry activities.	The Project overlaps with areas of forest management units and may limit access to forest resources and how forestry activities are managed.
Land and Resource Use	Hunting	The Project does not overlap hunting areas.	The Project overlaps with portions of hunting areas but does not limit the ability to carry out hunting activities.	The Project overlaps with several hunting areas and may affect how these hunting areas are accessed but does not substantially limit the ability to carry out hunting activities.
Land and Resource Use	Trapping	The Project does not overlap trapline areas.	The Project overlaps with small portions of trapline areas and affects a few individual trappers and/or will not limit the ability to carry out trapping activities.	The Project overlaps with large portions of trapline areas which may limit the ability to carry out trapping activities.
Land and Resource Use	Recreational and Commercial Fishing	The Project does not affect waterbodies used for fishing.	The Project may affect a small number of waterbodies used for fishing but does not limit the ability to fish.	The Project may affect several waterbodies used for fishing and limits the ability to fish.
Land and Resource Use	Cottages and Outfitters	The Project is not proximal to cottage areas or areas used by outfitters.	The Project is proximal to cottage areas or areas used by outfitters and may require the removal of a few cottages but will not limit the use of these areas by most cottagers/outfitters.	The Project is proximal to cottage areas or areas used by outfitters and may change access to or require the removal of multiple cottages which may limit the use of these areas for most cottagers/outfitters.

Discipline	Indicator	Level I	Level II	Level III
Land and Resource Use	Navigable Waters	The Project is not proximal to navigable waters.	The Project is proximal to canoe routes/waterways used for canoeing/portaging and does not limit the ability to use these navigable waters.	The Project overlaps with portions of canoe routes/waterways used for canoeing/portaging and limits the ability to use these navigable waters.
Land and Resource Use	Other Recreational Uses	The Project does not overlap areas used for outdoor recreation activities (snowmobile trails, hiking, etc.)	The Project overlaps or changes access to portions of outdoor recreation areas but does not limit the ability to participate in outdoor recreation activities.	The Project overlaps or changes access to portions of outdoor recreation areas and limits the ability to participate in outdoor recreation activities.
Traditional Land Use	Plant Harvesting	The Project does not overlap with areas used for traditional plant harvesting.	The Project overlaps with areas used for traditional plant harvesting but does not limit the ability to harvest plants.	The Project overlaps with areas used for traditional plant harvesting and limits the ability to harvest plants.
Traditional Land Use	Traditional Hunting	The Project does not overlap with areas used for traditional hunting.	The Project overlaps with portions of traditional hunting areas but does not limit the ability to carry out hunting activities.	The Project overlaps with traditional hunting areas and limits the ability to carry out hunting activities.
Traditional Land Use	Fishing	The Project does not affect waterbodies used for traditional fishing.	The Project may affect a small number of waterbodies used for traditional fishing but does not limit the ability to fish.	The Project may affect several waterbodies used for traditional fishing and limits the ability to fish.
Traditional Land Use	Canoeing	The Project is not proximal to traditional navigable waters.	The Project is proximal to traditional canoe routes/waterways used for canoeing/portaging and does not limit the ability to use these navigable waters.	The Project overlaps with portions of traditional canoe routes/waterways used for canoeing/portaging and limits the ability to use these navigable waters.

Discipline	Indicator	Level I	Level II	Level III
Traditional Land Use	Cultural, Spiritual and Ceremonial Sites	The Project does not overlap important cultural, spiritual or ceremonial sites.	The Project overlaps or changes access to important cultural, spiritual and ceremonial sites but does not limit the ability to use these sites.	The Project is proximal to important cultural, spiritual and ceremonial sites and limits the ability to use these sites.
Visual Aesthetics	Change in Landscape from Receptor Locations	No perceptible change in landscape.	Perceptible change in landscape, which does not affect enjoyment of the viewscape.	Perceptible change in landscape, which may affect enjoyment of the viewscape.
Visual Aesthetics	Change in Landscape from Non-Receptor Locations	No perceptible change in landscape.	Perceptible change in landscape, which does not affect enjoyment of the viewscape.	Perceptible change in landscape, which may affect enjoyment of the viewscape.
Visual Aesthetics	Change in Landscape due to the Transmission Line	No perceptible change in landscape.	Perceptible change in landscape, which does not affect enjoyment of the viewscape.	Perceptible change in landscape, which may affect enjoyment of the viewscape.
Socio-Economic	Labour Market	Effects are expected to occur and are within the normal range of variability.	Effects may result in a measurable change to the socio-economic indicator outside of the normal range of variability, although the changes are not substantive enough to require or result in a community or government response or investment.	Effects may result in substantive changes to the socio-economic indicator requiring or resulting in a management response or investment by community or government.
Socio-Economic	Business Opportunities	Effects are within the capabilities of existing businesses.	Effects may require investment or expansions to meet Project needs that are within the capabilities of existing businesses.	Effects may result in a strain on capacity of businesses to make investments required to meet Project demands.

Discipline	Indicator	Level I	Level II	Level III
Socio-Economic	Government Finances	Effects are expected to occur and are within the normal range of variability.	Effects are outside of the normal range of variability, although the changes are not substantive enough to result in a community or government response.	Effects may result in substantive changes to the socio-economic indicator resulting in a management response by community or government.
Socio-Economic	Population and Demographics	Effects are within the normal range of variability.	Effects are outside of the normal range of variability, although the changes are not substantive enough to result in a community or government response.	Effects may result in substantive changes to the socio-economic indicator resulting in a management response by community or government.
Socio-Economic	Community Health Conditions	Effects are within the normal range of variability.	Health conditions change from baseline conditions so that some investment in health care services to manage this change may be necessary.	Health conditions change from baseline conditions so that interventions or large and potentially unattainable investment in health care services to manage this change may be necessary.
Socio-Economic	Housing and Temporary Accommodation	Effects are manageable within the stock of existing housing and temporary accommodations.	Effects may require investment to meet Project housing needs that are within the capabilities of communities / developers.	Effects may result in a strain on capacity of communities or developers to make investments required to meet Project demands.
Socio-Economic	Public Utilities	Effects are manageable within the existing capacities of public utilities.	Effects may require investment to meet Project needs that are within the capabilities of communities or governments.	Effects may result in a strain on capacity of communities or governments to make investments required to meet Project demands.
Socio-Economic	Education	Effects are manageable within the existing capacities of schools and/or education institutions.	Effects may require investment to meet Project needs that are within the capabilities of schools and/or education institutions.	Effects may result in a strain on capacity of schools and/or education institutions to make investments required to meet Project demands.

Discipline	Indicator	Level I	Level II	Level III
Socio-Economic	Emergency Services	Effects are manageable within the existing capacities of emergency service providers.	Effects may require investment to meet Project needs that are within the capabilities of emergency service providers.	Effects may result in a strain on capacity of emergency service providers to make investments required to meet Project demands.
Socio-Economic	Other Community Services	Effects are manageable within the existing capacities of community service providers.	Effects may require investment to meet Project needs that are within the capabilities of community service providers.	Effects may result in a strain on capacity of community service providers to make investments required to meet Project demands.
Socio-Economic	Transportation	Effects are manageable within the existing capacities of highway service levels.	Traffic may increase but does not require investment in roadway infrastructure to accommodate Project demands.	Traffic may increase and results in government investment in roadway infrastructure to accommodate Project demands.
Archaeology	Effect on Heritage Sites	The Project is not proximal to archaeological sites or the site has been assessed and cleared in accordance with the *Heritage Act*.	Displacement of small portions of the archaeological site, compaction or changes that result in loss of access to archaeological sites, changes that indirectly affect the integrity of archaeological sites.	The removal of entire or valuable portions of archaeological sites as a result of ground disturbance; major changes to context and accessibility of sites.
Cultural Heritage Landscapes and Built Heritage Resources	Effect on Heritage Resources	The Project is not proximal to cultural heritage resources or changes to viewscape and site context that does not affect the integrity of cultural heritage resources.	Displacement or changes that result in loss of access to cultural heritage landscapes and/or built heritage resources, changes that indirectly affect the integrity of cultural heritage resources.	The removal of entire or valuable portions of cultural heritage resources as a result of ground disturbance; major changes to context and accessibility of sites.

6.1.2 Geographic Extent

The assessment of effects on the environment takes into consideration the geographic extent. Three levels have been defined: the Project footprint, the LSA and the RSA (see Chapter 4). The physical, biological and human environment disciplines will use these set spatial boundaries to describe how far each effect is expected to happen. No effects are expected beyond the RSA.

6.1.3 Duration

The levels of the duration assessment criterion were established in relation to the Project life. Effects to indicators will be assessment separately for the different phases of the Project. The Project phases and duration are as follows:

- Construction phase: 2 years
- Operations phase: 17 years
- Closure phase: 2-5 years
- Post-closure phase: stages I and II

6.1.4 Determination of Significance

The significance of the residual adverse effects, or impacts, is determined through the integration of the five assessment criteria previously described and defined. The significance is then defined as either *significant* or *not significant*.

Significance has been assigned through the application of a decision tree which reflects the nature of and the potential for an environmental impact. The decision tree for the assessment determination is presented in Graphic 6-1.

A decision tree is used as a transparent tool to determine significance. Rather than using a scoring or ranking system for each assessment criterion and then assigning significance based on a certain score, the decision tree clearly shows the level of significance for each combination of the five assessment criteria. In this manner, for each of the effects assessed, a level of significance (i.e., *significant* or *not significant*), based on the logic of the decision tree, is then determined. This allows all interested parties to clearly follow and understand how conclusions on significance have been derived for each of the effects assessed.

The decision tree for the Côté Gold Project was developed by a team of professionals, providing technical expertise and experience as to what combination of assessment criteria should result in a *significant* or *not significant* effect. The general logic is as follows:

- If the magnitude of the effect is comparable to baseline conditions, the effect is not noticeable and the impact is considered *not significant*.
- If the effect is limited to the Project site and it is reversible, the impact is considered *not significant*.
- If the magnitude of the effect is clearly distinguishable but meets guidelines or is within the environment's adaptive capabilities and extends beyond the Project site, the impact is considered *not significant*, if the effect is reversible.
- If the effect extends far beyond the Project site, the effect lasts past the life of the Project and is not reversible, the impact is considered *significant*.
- If the magnitude of the effect exceeds guidelines or is beyond the environment's adaptive capability and the effect is such that it is not reversible, the impact is considered *significant*.

The decision tree for this project has been developed based on experience with other comparable projects in Ontario and internationally, and is consistent with the Agency guidance (CEAA, 1994). Residual adverse effects that are determined to be significant are not acceptable for the Project and when required, further mitigation, monitoring and management measures were incorporated in the Project to reduce the significance level of such potential effects.

6.1.5 Likelihood

After having determined the significance of an impact, each impact has been assigned a level of likelihood.

6.2 Results

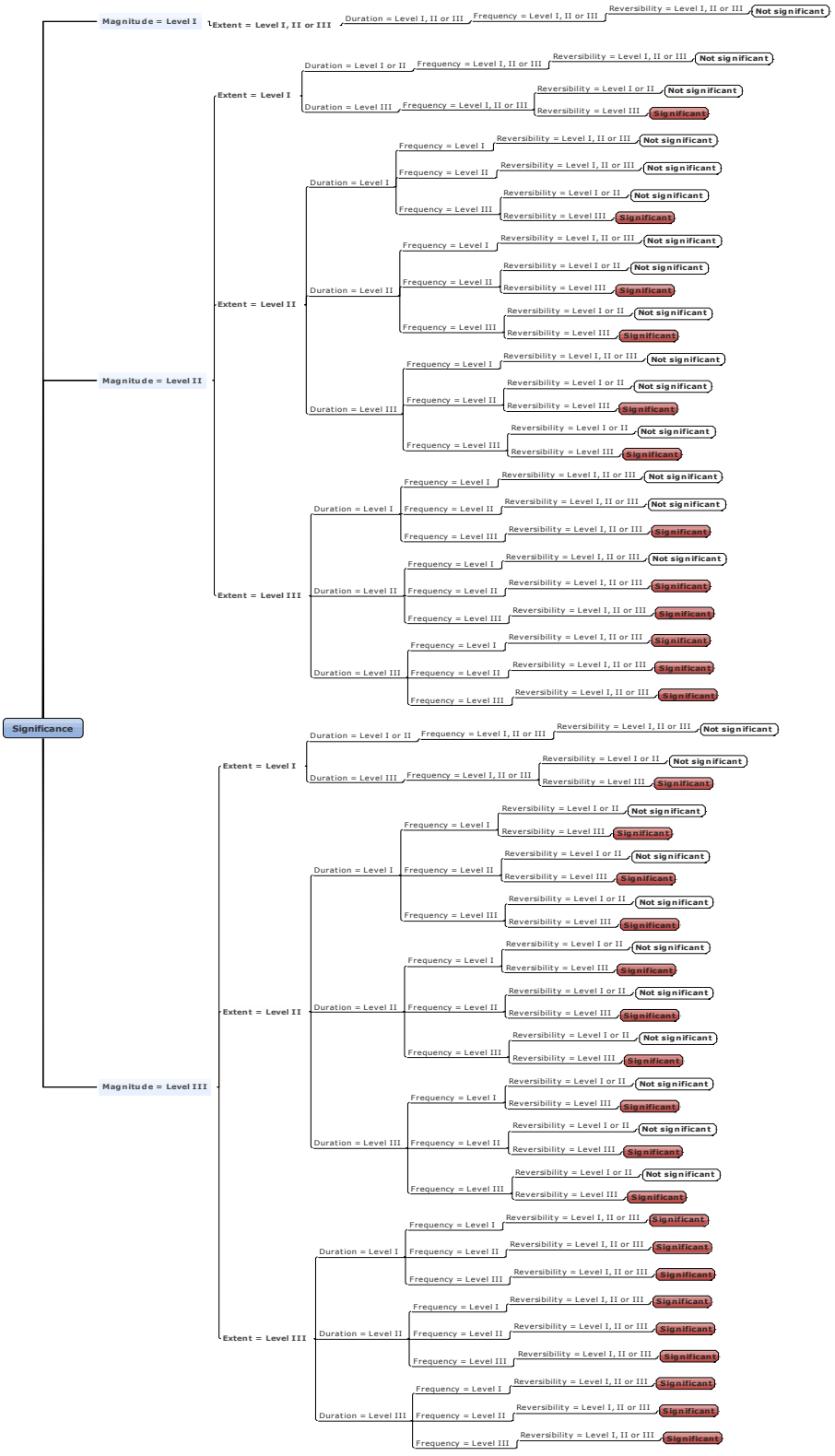
Results of the impact assessment for each Project phase are provided in detail in Appendix E, and include:

- Effects where the impact assessment resulted in criteria levels that differ from the EA;
- effects that have changed as a result of Project optimization, but where the impact assessment resulted in criteria levels unchanged from the EA; and
- effects that are unchanged from the EA since they are unaffected by the optimization of the Project.

Tables 6-3 to 6-6 provide summaries of the impact assessment results where impact criteria levels differ for the Project in the EER from the EA report. With the application of mitigation

measures, all physical, biological and human environment residual adverse effects, or impacts, have been assessed to be *not significant.*

Graphic 6-1: Decision Tree to Determine Residual Effect/Impact Significance



6.2.1 Impact Assessment Matrix – Construction Phase

Table 6-3 provides the differences in the impact assessment between the EER and the EA for the Construction Phase.

Table 6-3: Impact Assessment Matrix for the Construction Phase

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Air Quality	There are no changes to the impact assessment criteria levels for air quality compared to the EA.											
Noise & Vibration	Daytime Noise Level	Changes in noise levels due to construction activities, including equipment movement, haulage and stockpiling operations.	– 1 km setback distances to be kept at the Project site between the construction location and the receptors – Construction equipment not to exceed noise levels specified in NPC-115 and NPC-118	EA	Level II	Level II	Level I	Level III	Level I	Not Significant	Not Significant	Likely	Impacts are reduced compared to the EA. Daytime noise below baseline levels due to reduced footprint.
				EER	Level I	Level II	Level I	Level III	Level I				
				EA	Noise level above daytime baseline (44 dBA) and below or equal to 45 dBA.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	Noise level below or equal to daytime baseline of 44 dBA.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
Noise & Vibration	Nighttime Noise Level	Changes in noise levels due to construction activities, including equipment movement, haulage and stockpiling operations.	– 1 km setback distances to be kept at the Project site between the construction location and the receptors – Construction equipment not to exceed noise levels specified in NPC-115 and NPC-118	EA	Level III	Level II	Level I	Level III	Level I	Not Significant	Not Significant	Likely	Impacts are reduced compared to the EA. Noise levels are below NPC-115 and NPC-118 for nighttime operation.
				EER	Level II	Level II	Level I	Level III	Level I				
				EA	Noise level above 40 dBA.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	Noise level above nighttime baseline (34 dBA) and below or equal to 40 dBA.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				

Table 6-3: Impact Assessment Matrix for the Construction Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude		Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Hydrogeology	Groundwater Levels (Water Table)	Localized changes in groundwater levels due to construction activities, mainly watercourse realignments.	Not applicable	EA	Level III	Level I	Level I	Level III	Level III	Not Significant	Not Significant	Not Likely	Impacts are comparable to the EA. Water levels normalize with realignment channels following construction completion
				EER	Level III	Level I	Level I	Level III	Level II				
				EA	Change in the water table elevation is predicted to be greater than 5 m.	Effect is restricted to the Project footprint	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is not reversible				
				EER	Change in the water table elevation is predicted to be greater than 5 m.	Effect is restricted to the Project footprint	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
Hydrology and Climate	There are no changes to the impact assessment criteria levels for hydrology and climate compared to the EA.												
Water Quality	Change in Water Quality	Changes in water quality due to erosion and runoff which could potentially increase total suspended solids in water courses. Best Management Practices will be used during the construction phase, which will prevent changes in water quality.	– Best Management Practices (BMPs) and engineering design to limit soil erosion and mobilization/transport of sediments from disturbed areas	EA	Level II	Level II	Level I	Level II	Level I	Not Significant	Not Significant	Not likely	Impacts are reduced compared to the EA. The reduced footprint reduces the potential of total suspended solids entering watercourses.
				EER	Level II	Level II	Level I	Level I	Level I				
				EA	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs intermittently or with a certain degree of regularity	Effect is fully reversible				
				EER	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs infrequently	Effect is fully reversible				

Table 6-3: Impact Assessment Matrix for the Construction Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude		Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Terrestrial Biology	Ungulates	Potential change in ungulates population abundance and distribution due to habitat removal during the construction phase. Site construction will remove an estimated 1,106 ha of suitable moose winter habitat and 1,074 ha of suitable moose summer habitat. Additional effects are potentially associated with general disturbance and vehicular collisions.	– Reduce risk of mortality to wildlife – Minimize construction of new roads – No hunting by Project personnel – Enforce speed limits on Project roads – Awareness trainings for employees	EA	Level I	Level III	Level I	Level III	Level II	Not Significant	Not Significant	Not likely	Impacts are reduced compared to the EA. Less habitat being disturbed due to a reduced Project footprint.
				EER	Level I	Level II	Level I	Level III	Level II				
				EA	There is no measurable residual effect to population abundance and distribution.	Effect extends into the regional study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	There is no measurable residual effect to population abundance and distribution.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
Terrestrial Biology	Furbearers	Potential change in furbearers' population abundance and distribution due to habitat removal during the construction phase. Site construction will remove an estimated 355 ha of suitable beaver habitat. Between 1,074 and 1,266 ha of suitable black bear, eastern wolf, and American marten habitat will be removed from construction of the Project. Additional effects are potentially associated with general disturbance and vehicular collisions.	– Reduce risk of mortality to wildlife – Minimize construction of new roads – No hunting by Project personnel – Enforce speed limits on Project roads – Awareness trainings for employees	EA	Level I	Level III	Level I	Level III	Level II	Not Significant	Not Significant	Not likely	Impacts are reduced compared to the EA. Less habitat being disturbed due to a reduced Project footprint.
				EER	Level I	Level II	Level I	Level III	Level II				
				EA	There is no measurable residual effect to population abundance and distribution.	Effect extends into the regional study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	There is no measurable residual effect to population abundance and distribution.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				

Table 6-3: Impact Assessment Matrix for the Construction Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude		Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Terrestrial Biology - TL	Ungulates - Moose	Potential change in moose population abundance and distribution due to the construction of the transmission line alignment. This will result in the removal of 549.2 ha of habitat including areas with high potential Moose aquatic carrying capacities as well as 24 ha of identified over-wintering areas and portions of areas with the potential to support moderate to high densities of Moose in the dormant season. Additional effects are potentially associated with general disturbance and vehicular collisions.	– Reduce risk of mortality to wildlife – Minimize construction of new roads – No hunting by Project personnel – Enforce speed limits on Project roads – Awareness trainings for employees	EA	Level I	Level III	Level I	Level III	Level I	Not Significant	Not Significant	Not likely	Impacts are reduced compared to EA. Reduced power requirement allows the Project to utilize a TLA from the Shining Tree Distribution Station.
				EER	Level I	Level II	Level I	Level III	Level I				
				EA	There is no measurable residual effect to population abundance and distribution.	Effect extends into the regional study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	There is no measurable residual effect to population abundance and distribution.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
Aquatic Biology	There are no changes to the impact assessment criteria levels for aquatic biology compared to the EA.												
Land and Resource Use	Mineral Exploration	Changes in access to other claim areas or effects on the ability to exercise exploration activities within these claim areas during the construction phase.	– Work with claim holders to identify access changes and negotiate access agreements if there is any requirement to use or cross IAMGOLD properties	EA	Level II	Level II	Level I	Level III	Level II	Not Significant	-	-	Impact is no longer applicable. IAMGOLD has acquired the mineral claims within the Project area.
				EER	-	-	-	-	-				
				EA	The Project overlaps or changes access to other mining claims but does not limit the ability to exercise exploration activities.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	-	-	-	-	-				
Traditional Land Use	There are no changes to the impact assessment criteria levels for traditional land use compared to the EA.												

Table 6-3: Impact Assessment Matrix for the Construction Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Human and Ecological Health Risk	There are no changes to the impact assessment criteria levels for human and ecological health risk compared to the EA.											
Visual Aesthetics	There are no changes to the impact assessment criteria levels for visual aesthetics compared to the EA.											
Socio-economics	There are no changes to the impact assessment criteria levels for socio-economics compared to the EA.											
Archaeology	Effect on Heritage Sites	Changes to physical or cultural heritage resources including structures, sites or things of historical, archaeological, paleontological or architectural importance that may be overprinted by Project components.	– Completed mitigation - archaeological assessments Stages 1, 2, 3 and 4, as required – Buffer zones are established, as required – Monitor dewatering of Côté Lake	EA	Level I	Level II	Level I	Level III	Level III	Not Significant	Not Significant	Not likely	Impacts are comparable to the EA. Changes in MTCS protocols regarding the curation and storage of artifacts. Discussions with MFN are in progress to identify suitable public institution(s). Inspecting newly-exposed shorelines.
				EER	Level I	Level I	Level I	Level III	Level III				
				EA	The Project is not proximal to archaeological sites or the site has been assessed and cleared in accordance with the Heritage Act.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is not reversible				
				EER	The Project is not proximal to archaeological sites or the site has been assessed and cleared in accordance with the Heritage Act.	Effect is restricted to the Project footprint	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is not reversible				

6.2.2 Impact Assessment Matrix – Operations Phase

Table 6-4 provides the differences in the impact assessment between the EER and the EA for the Operations Phase.

Table 6-4: Impact Assessment Matrix for the Operations Phase

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Air Quality	There are no changes to the impact assessment criteria levels for air quality compared to the EA.											
Noise and Vibration	There are no changes to the impact assessment criteria levels for noise and vibration compared to the EA.											
Hydrogeology	There are no changes to the impact assessment criteria levels for hydrogeology compared to the EA.											
Hydrology and Climate	There are no changes to the impact assessment criteria levels for hydrology and climate change compared to the EA.											
Water Quality	Change in Water Quality	Changes in water quality due to Project discharges and runoff. Parameters potentially exceeding baseline include: ammonia, arsenic, barium, calcium, chloride, cobalt, copper, molybdenum, nickel, nitrate, phosphorus, potassium, sodium, strontium, sulphate, uranium.	– Best Management Practices (BMPs) and engineering design to limit soil erosion and mobilization/transport of sediments from disturbed areas – Treatment of process water; construction and operation of engineered water management systems to collect runoff and seepage from the TMF; reclaim water; returned (or recycled) to the process plant; use of liners on starter tailings dams to limit seepage losses during the early years of operations – Management of solid domestic and industrial waste in a permitted landfill, including the use of BMPs – Inclusion of PAG rock within the bulk of the MRA – BMPs for explosives use – Treatment of sewage – Monitoring and treatment of effluent, monitoring of groundwater quality and remedial action, as required	EA	Level II	Level II	Level II	Level III	Level II	Not Significant	Not Significant	Likely	Impacts are comparable to the EA. Average arsenic concentrations slightly exceed water quality guidelines on an infrequent basis.
				EER	Level III	Level II	Level II	Level I	Level II				
				EA	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is between 2 and 15 years (or Operations).	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	Concentrations greater than baseline concentrations and greater than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is between 2 and 15 years (or Operations).	Effect occurs infrequently	Effect is partially reversible				

Table 6-4: Impact Assessment Matrix for the Operations Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Terrestrial Biology	There are no changes to the impact assessment criteria levels for terrestrial biology compared to the EA.											
Aquatic Biology	Aquatic Toxicity	Effects on aquatic species due to changes in water quality, primarily related to Project discharges.	– Site specific water quality objectives will need to be developed for these substances or effluent treatment will need to be employed such that protection of aquatic life is assured	EA	Level I	Level II	Level II	Level III	Level I	Not Significant	Not Significant	Likely	Impacts are reduced compared to EA. Water quality predictions indicated that fewer substances were elevated above benchmarks relative to the EA, and concentrations of most substances achieve water quality guidelines with the exception of arsenic, which is expected to periodically exceed the water quality guideline (CCME) during the dry year (1 in 25 year). However, the maximum predicted monthly average concentration is only marginally over the guidelines (0.0071 mg/L) and does not exceed toxicity thresholds.
				EER	Level I	Level II	Level II	Level II	Level I				
				EA	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Effect extends into the local study area	The duration of the effect is between 2 and 15 years (or Operations).	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Effect extends into the local study area	The duration of the effect is between 2 and 15 years (or Operations).	Effect occurs intermittently or with a certain degree of regularity	Effect is fully reversible				

Table 6-4: Impact Assessment Matrix for the Operations Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures		Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Aquatic Biology	Commercial, Recreational, Aboriginal Fisheries	Loss of aquatic habitat due to construction of Project components. Lotic habitat affected includes Mollie River, Clam Creek and Bagsverd Creek. Lentic habitat affected includes Côté Lake, Beaver Pond, Clam Lake, Little Clam Lake, Unnamed Pond #3 and East Beaver Pond.	– Spawning habitat within the water bodies affected will be included in the Fisheries Act Authorization for the site as a loss of habitat and will be addressed through the compensation plan (including modifications to ensure flow, fish passage and use of habitats) – Design of the realignment channels will incorporate the life cycle requirements of the resident fish species and promote, where possible, an increase in habitat.	EA	Level I	Level I	Level I	Level III	Level II	Not Significant	Not Significant	Not likely	Impacts are reduced compared to EA. The habitat area to be lost is approx. 33% less than the EA due to a reduced open pit footprint. The resulting habitat borders the open pit and will be affected by blasting until the mining level of the open pit is below the area of effect.
				EER	Level I	Level I	Level I	Level II	Level II				
				EA	There is no measurable residual effect to communities or populations.	Effect is restricted to the Project footprint	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	There is no measurable residual effect to communities or populations.	Effect is restricted to the Project footprint	The duration of the effect is less than or equal to 2 years	Effect occurs intermittently or with a certain degree of regularity	Effect is partially reversible				
Land and Resource Use	Mineral Exploration	Changes in access to other claim areas or effects on the ability to exercise exploration activities within these claim areas during the operations phase.	– Re-route the Chester Access Road south of the Project site	EA	Level II	Level II	Level II	Level III	Level II	Not Significant	-	-	Impact is no longer applicable. IAMGOLD has acquired the mineral claims within the Project area.
				EER	-	-	-	-	-				
				EA	Concentrations are below Federal and/or Provincial criteria (<120 µg/m³).	Effect extends into the local study area	The duration of the effect is between 2 and 15 years (or Operations).	Effect occurs infrequently	Effect is fully reversible				
				EER	-	-	-	-	-				

Table 6-4: Impact Assessment Matrix for the Operations Phase (cont'd)

Discipline	Indicator	Effect	– Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood of the Effect	Comparison Between EA and EER
Traditional Land Use	There are no changes to the impact assessment criteria levels for traditional land use compared to the EA.											
Human and Ecological Health Risk	There are no changes to the impact assessment criteria levels for human and ecological health risk compared to the EA.											
Socio-economics	There are no changes to the impact assessment criteria levels for socio-economics compared to the EA.											
Archaeology	Effect on Heritage Sites	Changes to physical or cultural heritage resources including structures, sites or things of historical, archaeological, paleontological or architectural importance that may be overprinted by Project components.	Completed mitigation	EA	Level I	Level II	Level II	Level III	Level III	Not Significant	Not Significant	Not Likely	Impacts are comparable to the EA. Field work is on-going to support the EER and priorities have been updated to reflect the Project footprint.
				EER	Level I	Level I	Level I	Level II	Level III				
				EA	The Project is not proximal to archaeological sites or the site has been assessed and cleared in accordance with the Heritage Act.	Effect extends into the local study area	The duration of the effect is between 2 and 15 years (or Operations).	Effect occurs frequently or continuously	Effect is not reversible				
				EER	The Project is not proximal to archaeological sites or the site has been assessed and cleared in accordance with the Heritage Act.	Effect is restricted to the Project footprint	The duration of the effect is less than or equal to 2 years	Effect occurs intermittently or with a certain degree of regularity	Effect is not reversible				

6.2.3 Impact Assessment Matrix – Closure Phase

Table 6-5 provides the differences in the impact assessment between the EER and the EA for the Closure Phase.

Table 6-5: Impact Assessment Matrix for the Closure Phase

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood	Comparison Between EA and EER
Air Quality	There are no changes to the impact assessment criteria levels for air quality compared to the EA.											
Noise and Vibration	There are no changes to the impact assessment criteria levels for noise and vibration compared to the EA.											
Hydrogeology	There are no changes to the impact assessment criteria levels for hydrogeology compared to the EA.											
Hydrology and Climate	There are no changes to the impact assessment criteria levels for hydrology and climate compared to the EA.											
Water Quality	Change in Water Quality	Changes in water quality due to erosion and runoff which could potentially increase total suspended solids in water courses. For the purposes of a conservative effects prediction, the water quality model results for the Operations phase were applied to the Closure phase.	– Best Management Practices (BMPs) and engineering design to limit soil erosion and mobilization/transport of sediments from disturbed areas – Management of solid domestic and industrial waste in a permitted landfill, including the use of BMPs – Inclusion of PAG rock within the bulk of the MRA – Construction and operation of engineered water management systems to collect runoff and seepage; monitoring and treatment of effluent, as required.	EA	Level II	Level II	Level I	Level III	Level II	Not Significant	Not Significant	Not likely	Impacts are comparable to the EA. Applying model results for the Operations phase to the effects assessment for the Closure phase is a conservative approach.
				EER	Level III	Level II	Level I	Level I	Level II			
				EA	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	Concentrations greater than baseline concentrations, and greater than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs infrequently	Effect is partially reversible				
Terrestrial Biology	There are no changes to the impact assessment criteria levels for terrestrial biology compared to the EA.											

Table 6-5: Impact Assessment Matrix for the Closure Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude		Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood	Comparison Between EA and EER
Aquatic Biology	Aquatic Toxicity	Effects on aquatic species due to changes in water quality. Best Management Practices will be used during the closure phase, which will prevent changes in water quality. No planned discharge.	Not applicable	EA	Level I	Level II	Level I	Level III	Level I	Not Significant	Not Significant	Likely	Impacts are reduced compared to EA. Predictions appear to be improved compared to those in the EA resulting from a decreased footprint.
				EER	Level I	Level II	Level I	Level I	Level I				
				EA	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs infrequently	Effect is fully reversible				
Aquatic Biology	Commercial, Recreational, Aboriginal Fisheries	Effects on commercial, recreational and Aboriginal fisheries due to site runoff during closure. Best Management Practices will be used during the closure phase, which will prevent changes in water quality. No planned discharge.	Not applicable	EA	Level I	Level II	Level I	Level III	Level I	Not Significant	Not Significant	Not Likely	Impacts are comparable to the EA. Habitat potentially lost in the EA (East Clam Lake) is no longer lost but is temporarily affected during Construction and Operations blasting. Effect is removed in Closure.
				EER	Level I	Level II	Level I	Level II	Level II				
				EA	There is no measurable residual effect to communities or populations.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	There is no measurable residual effect to communities or populations.	Effect extends into the local study area	The duration of the effect is less than or equal to 2 years	Effect occurs intermittently or with a certain degree of regularity	Effect is partially reversible				
Land and Resource Use	Mineral Exploration	Changes in access to other claim areas or effects on the ability to exercise exploration activities within these claim areas during the closure phase.	– Work with claim holders to identify access changes and negotiate access agreements if there is any requirement to use or cross IAMGOLD properties	EA	Level II	Level II	Level I	Level III	Level II	Not Significant	-	-	Impact is no longer applicable. IAMGOLD has acquired the mineral claims within the Project area.
				EER	-	-	-	-	-				
				EA	The Project overlaps or changes access to other mining claims but does not limit the ability to exercise exploration activities.	Effect extends into the local study area	The duration of the effect is between 2 and 15 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	-	-	-	-	-				

Table 6-5: Impact Assessment Matrix for the Closure Phase (cont'd)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (EER)	Likelihood	Comparison Between EA and EER
Traditional Land Use	There are no changes to the impact assessment criteria levels for traditional land use compared to the EA.											
Human and Ecological Health Risk	There are no changes to the impact assessment criteria levels for human and ecological health risk compared to the EA.											
Socio-economics	There are no changes to the impact assessment criteria levels for socio-economics compared to the EA.											
Visual Aesthetics	There are no changes to the impact assessment criteria levels for visual aesthetics compared to the EA.											
Archaeology and Built Heritage	There are no changes to the impact assessment criteria levels for archaeology and built heritage compared to the EA.											

Table 6-5: Impact Assessment Matrix for the Post-Closure Phase

6.2.1 Impact Assessment Matrix – Post-Closure Phase

Table 6-6 provides the differences in the impact assessment between the EER and the EA for the Post-Closure Phase.

Table 6-6: Impact Assessment Matrix for the Post-Closure Phase

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude	Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (ERR)	Likelihood	Comparison Between EA and EER
Air Quality	There are no changes to the impact assessment criteria levels for air quality compared to the EA.											
Noise and Vibration	There are no changes to the impact assessment criteria levels for noise and vibration compared to the EA.											
Hydrogeology	There are no changes to the impact assessment criteria levels for hydrogeology compared to the EA.											
Hydrology and Climate	There are no changes to the impact assessment criteria levels for hydrology and climate compared to the EA.											
Water Quality	Change in Water Quality	Changes in water quality due to site runoff and, eventually, overflow from the flooded open pit.	– Best Management Practices (BMPs) and engineering design to limit soil erosion and mobilization/transport of sediments from disturbed areas – Management of solid domestic and industrial waste in a permitted landfill, including the use of BMPs – Inclusion of PAG rock within the bulk of the MRA – Monitoring and water collection and treatment as required	EA	Level II	Level II	Level III	Level III	Level II	Not Significant	Not Significant	Likely	Impacts are reduced compared to EA. The reduced footprint reduces the potential of total suspended solids entering water courses.
				EER	Level II	Level II	Level III	Level II	Level II				
				EA	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is beyond 15 years	Effect occurs frequently or continuously	Effect is partially reversible				
				EER	Concentrations greater than baseline concentrations, but less than water quality guidelines, where applicable.	Effect extends into the local study area	The duration of the effect is beyond 15 years	Effect occurs intermittently or with a certain degree of regularity	Effect is partially reversible				
Terrestrial Biology	There are no changes to the impact assessment criteria levels for terrestrial biology compared to the EA.											

Table 6-5: Impact Assessment Matrix for the Post-Closure Phase (con't)

Discipline	Indicator	Effect	Mitigation/Effects Management Measures	Magnitude		Extent	Duration	Frequency	Reversibility	Residual Impact Significance (EA)	Residual Impact Significance (ERR)	Likelihood	Comparison Between EA and EER
Aquatic Biology	Aquatic Toxicity	Effects on aquatic species due to site runoff and, eventually, overflow from the flooded open pit.	Not applicable	EA	Level I	Level II	Level III	Level III	Level I	Not Significant	Not Significant	Likely	Impacts are reduced compared to EA. Expedited flooding will allow water courses to return back to naturalized channels faster than modelled in the EA.
				EER	Level I	Level II	Level III	Level I	Level I				
				EA	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Effect extends into the local study area	The duration of the effect is beyond 15 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	Median concentrations less than guidelines or less than chronic toxicity thresholds for substances without guidelines.	Effect extends into the local study area	The duration of the effect is beyond 15 years	Effect occurs infrequently	Effect is fully reversible				
Aquatic Biology	Commercial, Recreational, Aboriginal Fisheries	Effects on commercial, recreational and Aboriginal fisheries due to site runoff and, eventually, overflow from the flooded open pit.	Not applicable	EA	Level I	Level II	Level III	Level III	Level I	Not Significant	Not Significant	Likely	Impacts are reduced compared to EA. Expedited flooding will allow watercourses to return to naturalized channels faster than modelled in the EA.
				EER	Level I	Level II	Level III	Level I	Level I				
				EA	There is no measurable residual effect to communities or populations.	Effect extends into the local study area	The duration of the effect is beyond 15 years	Effect occurs frequently or continuously	Effect is fully reversible				
				EER	There is no measurable residual effect to communities or populations.	Effect extends into the local study area	The duration of the effect is beyond 15 years	Effect occurs infrequently	Effect is fully reversible				
Land and Resource Use	There are no changes to the impact assessment criteria levels for land and resource use compared to the EA.												
Traditional Land Use	There are no changes to the impact assessment criteria levels for traditional land use compared to the EA.												
Human and Ecological Health Risk	There are no changes to the impact assessment criteria levels for human and ecological health risk compared to the EA.												
Visual aesthetics	There are no changes to the impact assessment criteria levels for visual aesthetics compared to the EA.												
Socio-economics	There are no changes to the impact assessment criteria levels for socio-economics compared to the EA.												
Archaeology and Built Heritage	There are no changes to the impact assessment criteria levels for archaeology and built heritage compared to the EA.												

7.0 UPDATED ENVIRONMENTAL MANAGEMENT

7.1 Background

Conceptual or preliminary environmental management plans for all phases of the Project, including follow-up monitoring plans, were a part of the EA. IAMGOLD recognizes that monitoring details may be further defined through consultation with federal and provincial government agencies, Indigenous groups and the public and other stakeholders through the environmental approvals and permitting processes that follow EA approval. As part of the EER process, Federal and Provincial EA conditions of approval were also screened to confirm applicability to the updated Project description (Appendix D).

The Project environmental management plans were reviewed and updated as required, in consideration of optimizations, and taking into consideration comments raised by stakeholders and Indigenous communities during the post-EA phase.

7.2 Objectives and Context

The aim of environmental management plans is to ensure that measures implemented to mitigate social and environmental effects are successful, that benefits from the Project are enhanced, that the Project is carried out in compliance with existing legislation, and that it is consistent with Federal and Provincial guidelines and best practices, as well as in line with IAMGOLD's policies.

Monitoring programs apply to the Construction, Operations, Closure and Post-closure phases of the Project, as appropriate, allowing for compliance of activities with all environmental approvals and permits, while providing information to determine the effectiveness of mitigation measures. Follow-up monitoring provides the ability for adaptive management should environmental effects vary from that predicted and mitigation measures require additional support as new information becomes available.

The principle of adaptive management will be applied to the Project's management plan. For the Project, this means that should monitoring results indicate that realized effects are different than predicted, mitigation strategies may be modified and monitoring requirements with regards to parameters, locations and frequency will be adapted appropriately.

The mitigation and monitoring measures included in the EER will be developed into more detailed stand-alone plans as the Project continues to progress into the environmental permitting processes and moves into Construction and Operations.

7.3 Reporting

Monitoring programs will be under the supervision of IAMGOLD and the site environmental manager. Reporting of monitoring programs will be conducted as per applicable environmental approvals and permit conditions. Reports will be reviewed and monitored by relevant agencies and authorities.

Upon receiving approval of the monitoring reports by the respective agencies and authorities, monitoring results will be provided to identified Indigenous groups and the public, as applicable.

7.4 Monitoring Measures and Plans

Monitoring measures and plans proposed for the Project for the physical, biological and human environments were identified in context of effects predictions and mitigation measures in the EER (see Chapters 4 and 5), and best practice environmental management.

The updates to proposed monitoring measures and plans are provided in Tables 7-1, 7-2 and 7-3. Descriptions have been provided of how and why these measures differ from the EA. A consolidated list of monitoring measures for the Project, including those which remain unchanged from the EA, is included in Appendix C-3.

7.4.1 Updated Monitoring Measures – Physical Environment

Table 7-1 summarizes updates to proposed monitoring measures for effects to the physical environment and provides a description as to how and why they differ from the EA.

Table 7-1: Monitoring Measures – Physical Environment

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Air Quality	There are no changes to the monitoring measures for air quality compared to the EA.					
Noise and Vibration	There are no changes to the monitoring measures for noise and vibration compared to the EA.					
Hydrogeology	There are no changes to the monitoring measures for hydrogeology compared to the EA.					
Hydrology and Climate	In-stream Characteristics	Water samples for total suspended solids will be manually sampled and submitted for laboratory analysis. Measurement of stream cross sections for channel geometry. Installation of erosion pin in stream bank and disturbance rods in streambed for sediment erosion / accumulation. Aerial or photographic analysis to assess stream meander.	Good Industry Practice	Construction to closure phases. Twice annually, during the spring melt and low flow conditions, to be initiated prior to realignment construction.	Reach of Bagsverd Creek downstream of Unnamed Lake #1 and upstream of Neville Lake.	Monitoring measure no longer applicable. Potential effects on Bagsverd Creek mitigated by project footprint reconfiguration.

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Water Quality	Surface water quality samples will be analyzed for various general chemistry, metals, ions, nutrients, cyanide species, a radionuclide, organic parameters, and total and methyl mercury. The parameters suite may be reduced if it can be demonstrated that any of the tests are not applicable.	Surface water grab sample collection using in-field filtering and preservation, as required. Quality assurance / quality control samples such as blind duplicates, trip blanks, field blanks and filter blanks will be collected during each sampling event to represent a minimum of 10% of the samples.	Provincial Water Quality Objectives (PWQO) and Canadian Water Quality Guidelines (CWQG), with laboratory detection limits suitable for comparison to these guidelines. *Metal Mining Effluent Regulations* (MMER) and Ontario Regulation 560/94. Concentrations in mine-exposed areas will also be compared to baseline and	Sampling events will be conducted during all Project phases at a frequency sufficient to detect changes in water quality; the frequency will depend on the station location and will aim to capture a range of flow conditions, as required. The frequency of effluent monitoring will meet federal and provincial effluent discharge requirements.	Project site components: open pit sump, seepage collection ponds, mine water pond, reclaim pond, polishing pond and domestic sewage effluent outlets as appropriate to the mine phase. Surface water receivers: Moore Lake, Chester Lake, Little Clam Lake, Clam Lake, Three Duck Lake (Upper, Middle and Lower basins), Mollie	Monitoring measure updated. Surface water receivers to be monitored have been updated from the EA to reflect the EER project description.

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
(Cont.) Water Quality	Additional parameters may be considered depending on site-specific characteristics.	(Cont.) Surface water grab sample collection using in-field filtering and preservation, as required. Quality assurance / quality control samples such as blind duplicates, trip blanks, field blanks and filter blanks will be collected during each sampling event to represent a minimum of 10% of the samples.	reference area values.	(Cont.) Sampling events will be conducted during all Project phases at a frequency sufficient to detect changes in water quality; the frequency will depend on the station location and will aim to capture a range of flow conditions, as required. The frequency of effluent monitoring will meet federal and provincial effluent discharge requirements.	River between Three Duck Lakes and Dividing Lake, Dividing Lake, Bagsverd Lake, Unnamed Lake #6, Schist Lake, Neville Lake, Mesomikenda Lake (upper basin) and downstream from the local study area (downstream from Mesomikenda Lake and Dividing Lake). Samples will also be collected in appropriate reference areas.	(Cont.) Monitoring measure updated. Surface water receivers to be monitored have been updated from the EA to reflect the EER project description.

7.4.2 Updated Monitoring Measures – Biological Environment

Table 7-2 summarizes updates to proposed monitoring measures for effects to the biological environment and provides a description as to how and why they differ from the EA.

Table 7-2: Monitoring Measures – Biological Environment

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Terrestrial Biology	There are no changes to the monitoring measures for terrestrial biology compared to the EA.					
Aquatic Biology	Water - metals, pH, nutrients, hardness, dissolved organic carbon, alkalinity. The parameters suite may be reduced if it can be demonstrated that any of the tests are not applicable. Additional parameters may be considered depending on site-specific characteristics.	Surface water grab sample collection using in-field filtering and preservation, as required. Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Quality assurance /quality control samples such as blind duplicates, trip blanks, field blanks and filter blanks will be collected during each sampling event to represent a minimum of 10% of the samples.	(MDL< PWQO/CWQG standards). Concentrations in mine-exposed areas will also be compared to baseline and reference area values.	Sampling events will be conducted during all project phases at a frequency sufficient to detect changes in water quality; the frequency will therefore depend on the station location and will aim to capture a range of flow conditions, as required. Monitoring will be conducted until conditions are stable or less than guidelines for the protection of aquatic life.	Downstream of Project discharge and in all areas potentially affected by mine related discharges as well as in appropriate reference areas.	Monitoring measure updated. Total and free cyanide should be added to the monitoring parameter list.

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Aquatic Biology	Fish tissue	Non-lethal biopsy tissue sampling methods will be used to collect skinless, boneless muscle samples (5 g filet) from live individuals. Samples will be analyzed for total mercury. Samples will be weighed and acid digested prior to analysis using a variant of "Environmental Protection Agency Method 1631- mercury in water by oxidation, purge and trap, and cold vapour atomic fluorescence spectrometry". Using this technique, low method detection limits of approximately 1 ng Hg/g wet tissue weight can be achieved.	Health Canada and Ministry of the Environment and Climate Change consumption benchmarks.	Every 3 years during Operations and twice following Closure or until mercury concentrations in fish are stable or equal to reference areas.	In areas affected by stream realignments and reference areas.	Monitoring measure updated. This monitoring should be conducted in New Lake and in reference lakes as no other terrestrial habitats are proposed for flooding.

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Aquatic Biology	Noise and Vibration	Acoustic monitoring to confirm the predicted effects of blasting in the Open Pit	DFO guideline for instantaneous underwater over pressure of 100 kPa for various fish habitats and a 13 mm/sec vibration guideline for various spawning habitats (Wright and Hopky 1998).	During Construction and within the first two years of Operations.	South east bay of Clam Lake and the north bay of New Lake.	New monitoring measure. The EA did not anticipate potential effects from blasting on fish habitat in Clam Lake and New Lake.

7.4.1 Updated Monitoring Measures – Human Environment

Table 7-3 summarizes updates to proposed monitoring measures for effects to the human environment and provides a description as to how and why they differ from the EA.

Table 7-3: Monitoring Measures – Human Environment

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Land and Resource Use	There are no changes to the monitoring measures for land and resource use compared to the EA.					
Traditional Land Use	Project effects on Indigenous traditional activities / traditional land use	*IAMGOLD will continue to discuss potential Project effects on traditional activities with potentially affected Indigenous communities throughout the life of the Project. Should additional information regarding an Indigenous community's traditional practices become available, IAMGOLD will review and consider any potential effects, and develop and implement necessary mitigation measures as appropriate.*	n/a	Construction through Closure phases	n/a	New monitoring measure. Added post-EA submission in response to comments received during the EA review period. This measure was added to the updated Appendix Y (EA Commitment Tables) and shared with CEAA, MOECC and Indigenous groups in February 2016.

Discipline	Parameter	Monitoring Method	Standard	Frequency / Timeframe	Location	Comparison between EA and EER
Human and Ecological Health Risk	There are no changes to the monitoring measures for human and ecological health risk compared to the EA.					
Visual Aesthetics	There are no changes to the monitoring measures for visual aesthetics compared to the EA.					
Socio-economic	Project-related socio-economic effects on Aboriginal and non-Aboriginal populations	*Socio-economic / Community Management Plan to monitor and respond to Project effects on Aboriginal and non-Aboriginal populations. Ongoing consultation with affected Aboriginal communities and stakeholders.*	n/a	Construction through Closure phases	n/a	New monitoring measure. Added post-EA submission in response to comments received during the EA review period. This measure was added to the updated Appendix Y (EA Commitment Tables) and shared with the CEAA, MOECC and Indigenous groups in February 2016.
Archaeology	The accepted approach to monitoring (i.e., 50 m "monitoring buffer" around archaeological sites) has not changed from the EA. Site-specific monitoring measures have been updated from the EA (see Appendix B-14).					

8.0 CONCLUSION

IAMGOLD has undertaken the EER to ensure changes to the Project have been duly assessed such that changes to the potential environmental effects of the Project are identified, documented and properly managed. Additionally, the EER provides IAMGOLD an opportunity to communicate these changes to government regulators, the public and Indigenous communities, and it is intended to comply with Federal and Provincial EA Conditions of Approval. Several meetings have been held with First Nation communities, Métis Nation of Ontario, along with hosting public open houses in Gogama, Timmins and Sudbury. Feedback received has led to further discussions and optimizations to the Project.

The results of the EER confirm that the predicted environmental effects of the Project are similar or reduced compared to the EA. Therefore, the conclusions of the EA, including the determinations of significance of residual effects, remain valid. The EER demonstrates that overall, the Project is an improvement compared to the EA.

9.0 REFERENCES

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10.0 ABBREVIATIONS

3D	3-Dimensional
AAQC	Ambient Air Quality Criteria
ABA	Acid Base Accounting
ANFO	Ammonium Nitrate/Fuel Oil
ARD	Acid Rock Drainage
BMP	Best Management Practice
$C0_2$	Carbon Dioxide
$CaCO_3$	Calcium Carbonate
CDA	Canadian Dam Association
CEAA	Canadian Environmental Assessment Agency
CHVI	Cultural Heritage Value or Interest
CIP	Carbon-in-Pulp
CN^-	Cyanide Ion
CNO^-	Cynate Ion
CWQG	Canadian Water Quality Guidelines
dBA	A-weighted Decibels
dBL	Linear decibels
DFO	Fisheries and Oceans Canada
DS	Distribution Station
EA	Federal Environmental Assessment
ECA	Environmental Compliance Approval
EDF	Environmental Design Flood
EER	Environmental Effects Review
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FMP	Forest Management Plan
FN	First Nations
FPFN	Flying Post First Nations
FS	Factor of Safety
GHG	Greenhouse Gas
H_2S0_4	Sulfuric Acid
Ha	Hectare
HCN	Hydrogen Cyanide
HDPE	High Density Polyethylene
HN_3	Ammonia
HPGR	High Pressure Grinding Rolls
IAMGOLD	IAMGOLD Corporation
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
kg	Kilogram
km	Kilometre
km^2	Square Kilometres
kV	Kilovolt
L	Litres
Leq	Loudness equivalent
LSA	Local Study Area
m	Metre
m^3	Square Metres
m^3/d	Cubic Metres per Day

m^3/h	Cubic Metres per Hour
masl	Metres Above Sea Level
MDL	Method Detection Limit
MFN	Mattagami First Nations
ML	Metal Leaching
mm/s	Millimetre per Second
MMER	Federal Metal Mining Effluent Regulations
MNO	Métis Nation of Ontario
MNO	Métis Nation of Ontario
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
MOU	Memorandum of Understanding
MPA	Maximum Potential Acidity
MRA	Mine Rock Area
Mt	Million Tonnes
MTCS	Ministry of Tourism, Culture and Sport
MW	Megawatt
$Na_2S_2O_5$	Sodium Metabisulphite
NAD 83	North American Datum of 1983
NAG	Non-Potentially Acid Generating
NP	Neutralization Potential
NPA	Navigation Protection Act
NPC	Noise Pollution Control
NPC	Noise Pollution Control
NPR	Neutralization Potential Ratio
PAG	Potentially Acid Generating
PCB	Polychlorinated Biphenyl
PM_{10}	Particulate Matter 10 Microns and Below
$PM_{2.5}$	Particulate Matter 2.5 Microns and Below
PMP	Probable Maximum Precipitation
PM_{tot}	Total Suspended Particulate Matter
POR	Point of Reception
PORs	Points of Reception
ppm	Parts Per Million
PPV	Peak Particle Velocity
PWQO	Provincial Water Quality Objectives
ROM	Run-of-Mine
ROW	Right-of-Way
RSA	Regional Study Area
S02	Sulphur Dioxide
Sanatana	Sanatana Resources
SAR	Species at Risk
SARA	Species at Risk Act
SO_x	Sulphur Oxides
the Project	Côté Gold Project
TK	Traditional Knowledge
TLA	Transmission Line Alignment
TLUS	Traditional Land Use Study
TMF	Tailings Management Facility
ToR	Terms of Reference

Tpd	Metric Tonne(s) Per Day
Trelawney	Trelawney Mining and Exploration Inc.
TRVs	Toxicity Reference Values
TS	Transformer Station
TSD	Technical Support Document
µg	Microgram
UTM	Universal Transverse Mercator
UTMs	Updated Technical Memorandums
VOCs	Volatile Organic Compounds